THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXVI. No. 649.] LONDON, OCTOBER 19, 1875. [27TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL
COAL. Analysis—10,000 cubic feet of gas per ton of coal: 26-candle gas; 13¼ cwt. coke per ton of coal.
The London Exhibition in 1851 was lighted with gas made from Ramsay's Cannel.
RAMSAY'S PATENT CONDENSED COKE.
DO. GARESFIELD COKE.

RAMSAY'S FIRE-CLAY ARTICLES.
GAS-RETORTS, introduced 1828. FIRE-BRICK WORKS, established 1804. FIRE-CLAY SANITARY PIPES, CHIMNEY-TOPS, and all Goods made of Fire-Clay. The Fire-Clay is worked from Blaydon Main Colliery, is of excellent quality, and no expense spared in perfecting every article. The FIRE-BRICKS (marked "RAMSAY") are to be seen in all parts of the world, and the Works are the most extensive in the Kingdom.
Manufactories—Derwenthaugh, Swalwell, and Hebburn Quay, near Newcastle-on-Tyne; and London Wharves—Falcon Wharf, No. 90, Bankside; and Honduras Wharf, Cubit Town. Large stocks kept.
Address G. H. RAMSAY, NEWCASTLE-ON-TYNE.

GENUINE TORBAY PAINT
AND
SPECIAL GASOMETER PAINT
(Mixed ready for use).
These Paints are now used in 100 Country Gas-Works, and by all (but one) of the London Gas Companies, on Gasholders, Scrubbers, Purifiers, &c. They will cover tar effectually. Also used by the Admiralty, War Office, Railway Companies, Founders, &c.
They prevent and arrest rust, and protect iron from the action of water, sulphurous and gaseous exhalations.
The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nos.* 2, 1866.
STEVENS & CO.,
(SUCCESSORS TO SAMUEL CALLEY. ESTABLISHED 20 YEARS.)
21, GT. WINCHESTER ST., LONDON.
WORKS: BRIXHAM, TORBAY.

PROUD'S
SPECIALITIES IN WOOD GRIDS
FOR
PURIFIERS & SCRUBBERS
MADE FROM THE BEST QUALITY
OF
WELL-SEASONED PLANKS.
SCRUBBERS FITTED WITH MR. LIVESEY'S BOARDS AT MODERATE COST.
BROOKFIELD WORKS,
103, ICKNIELD STREET EAST, BIRMINGHAM.

COWEN'S PATENT FIRE-CLAY RETORTS.
JOSEPH COWEN and CO.,
BLAYDON BURN, BLAYDON-ON-TYNE,
Were the only parties to whom a PRIZE MEDAL was awarded at the GREAT EXHIBITION of 1851, for "GAS-RETORTS and other OBJECTS in FIRE-CLAY," and they were also awarded at the INTERNATIONAL EXHIBITION of 1862, the PRIZE MEDAL for "GAS-RETORTS, FIRE-BRICKS, &c., for EXCELLENCE of QUALITY."
J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.
COWEN'S GARESFIELD COALS.
Coal Office,
QUAY SIDE, NEWCASTLE-ON-TYNE.
JOS. COWEN & Co. are the only Manufacturers of FIRE-BRICKS and CLAY RETORTS at BLAYDON BURN.

JOHN RUSSELL AND CO.,
THE WEDNESBURY TUBE-WORKS, WEDNESBURY;
AND
THE ALMA WORKS, WALSALL.
Established at the commencement of Gas Lighting.
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COMMERCIAL STREET, SPITALFIELDS;
5, CHARLES STREET, SOHO; and
16, SOHO SQUARE,
} LONDON
35, 36, 37, & 39, GRANBY ROW, MANCHESTER.
J. R. and Co. are the original manufacturers of Wrought-Iron Gas Tubes and Fittings, and Inventors of the LAP-WELDED TUBES for Locomotive and Marine Boilers.
J. R. and Co. make all kinds of Tubes and Fittings for Gas, Steam, and Water; Gun-Metal Cocks, Stocks, and Dies; Galvanized Tubes and High-Pressure Tubes, &c.
Lists may be obtained on application to
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JOHN BENT & SON,
BELL BARN ROAD, BIRMINGHAM,
MANUFACTURERS OF
WET AND DRY GAS-METERS,
OF
FIRST-CLASS MATERIALS & WORKMANSHIP;
Also, STATION-METERS, PRESSURE-GAUGES, STREET-LAMPS, REGULATORS, &c.
ESTABLISHED 1830.

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MANUFACTURERS OF
TELESCOPIC & SINGLE GASHOLDERS,
CAST & WROUGHT IRON TANKS FOR DITTO,
And Gas Apparatus of every Description.
Marine, Tubular, Cornish, Plain, Furnace, Saddle, and Range Boilers.
SUGAR, SALTPETRE, AND ALL KINDS OF PANS.
Roofs, Girders, and Bridges, and General Smith's Work.
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J. & H. ROBUS,
CONTRACTORS
FOR THE
ERECTION OF NEW & REMODELLING OF EXISTING GAS-WORKS.
RETORT-SETTING A SPÉCIALITÉ.
RETORTS SET, AND GUARANTEED TO BURN OFF A CERTAIN AMOUNT OF COAL, OR ELSE NO MONEY TAKEN FOR THE CONTRACT.
PLANS ON APPLICATION.
Retort-Setters sent to all parts of Europe and America.
Address, J. and H. ROBUS,
BELL GREEN, CATFORD, LONDON, S.E.

THE
NITSHILL COMPANY'S
DUKE OF HAMILTON'S
LESMAHAGOW
CANNEL COAL.
AGENT:
JAMES M'KELVIE,
HAYMARKET,
EDINBURGH.

LONDON, 1862. CLASS X.
LONDON, 1862. CLASS XXXI.
PARIS, 1867. SILVER MEDAL.
AMSTERDAM, 1869.
DIPLOMA D'EXCELLENCE.
MANCHESTER, VIENNA, 1873. THE ONLY MEDAL.
SILVER MEDAL 1875.

GEORGE GLOVER & CO.,
MANUFACTURERS OF
IMPROVED DRY GAS-METERS,
WARRANTED TO MEASURE CORRECTLY, AND NOT TO VARY.

EXTENSION OF PREMISES.
G. G. & Co. having had their premises entirely rebuilt, are now fairly in possession of large and commodious workshops, specially adapted to the requirements of the trade, and they are prepared to execute orders, large or small, with promptness and despatch.

THEY KEEP IN STOCK METERS OF ALL SIZES, UP TO 300 LIGHTS.

RANELAGH WORKS, RANELAGH ROAD, PIMLICO,
LONDON, S.W.;
236, GEORGE STREET, GLASGOW; and 30, LANCASTER AVENUE, MANCHESTER.
AGENT FOR AUSTRALIA:
A. DEMPSTER, 10, COLLINS STREET EAST, MELBOURNE.
G. G. & Co. have just been awarded a SILVER MEDAL for Gas-Meters and Gas Apparatus at the Exhibition of the "Society for the Promotion of Scientific Industry," Manchester.

SILVER MEDAL, PARIS EXHIBITION, 1867.

LLOYD AND LLOYD,

ALBION TUBE-WORKS, BIRMINGHAM,

MANUFACTURERS OF

WROUGHT-IRON TUBES AND FITTINGS

AND

LAP-WELDED IRON AND HOMOGENEOUS METAL BOILER TUBES.

Boiler-Tube Ferrules, Gun-Metal Gland Cocks, Water-Gauges, Whistles, &c.; Stocks, Taps, and Dies for Screwing, and Gas-Fitters Tools.

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LANCASHIRE GAS-METER COMPANY,

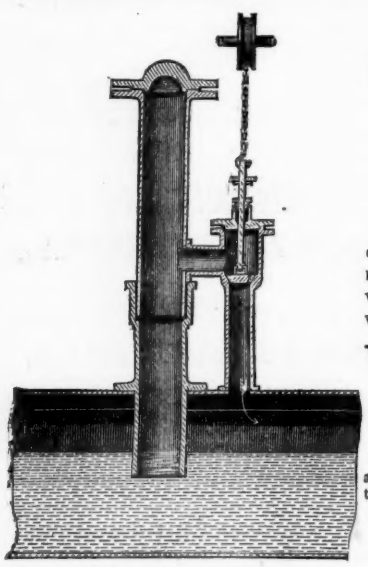
LIMITED,

FALCON STREET, OLDHAM,

MANUFACTURERS OF

GAS-METERS, GOVERNORS, EXPERIMENTAL GASHOLDERS, &c.

HENRY THOMAS, Managing Director.



COPP'S PATENT GAS APPARATUS

For the Removal of all Pressure caused by the Hydraulic Seal;

THE EFFECTS PRODUCED BEING

1.—A LARGE INCREASE IN THE YIELD OF GAS.

2.—AN ENTIRE PREVENTION OF THE DEPOSIT OF CARBON.

3.—THE ASCENSION-PIPES DO NOT CHOKE.

The apparatus is very simple in construction, and cannot get out of order, and being an outside addition to the present arrangement of works, can be applied so easily as to require no alteration of plant. It may be fitted whilst the retorts are in use, without interfering with the manufacture of gas. The cost is so small that the outlay will be repaid in a few weeks' working. For further particulars apply to the Patentee,

W. L. COPP, WATCHET GAS-WORKS, SOMERSET,

or, 232, BRIXTON ROAD, LONDON, S.W.

The Watchet and Williton Gas Company, Watchet, Somerset.

This is to certify that we have had Mr. W. L. Copp's Patent Anti-Dip Valves in work for six months, and that it has given an average increase yield of over one thousand feet of gas per ton of coals, and that the patent apparatus has in every respect given us the greatest satisfaction.

Given under the Seal of the Company, this 6th day of October, 1875.

JOHN THORNE, Chairman.

Many similar Testimonials will be forwarded on application to the Patentee.

TRADE MARK

THE MEDAL FOR 1862.

The only Prize Medal awarded for TUBES & FITTINGS.

CROWN TUBE-WORKS,

WEDNESBURY, STAFFORDSHIRE.

WAREHOUSE: SOUTHWARK STREET, LONDON.

JAMES RUSSELL & SONS, LIMITED,

PATENTEES & FIRST MAKERS OF WROUGHT-IRON TUBES,

ONLY MAKERS OF HOMOGENEOUS METAL TUBES.

MANUFACTURERS OF

TUBES and FITTINGS for GAS, STEAM, and WATER;

LAP-WELDED, LOCOMOTIVE, MARINE, and other BOILER TUBES;

HYDRAULIC TUBES, BEDSTEAD TUBES, WELL TUBES, TELEGRAPH POSTS, COILS, &c.;

GAS-FITTERS TOOLS, VALVES, COCKS, &c.

THOMAS PIGGOTT & CO.,

(Established 1822,)

SPRING HILL, BIRMINGHAM.

MANUFACTURERS OF

TELESCOPIC & SINGLE GASHOLDERS,

CAST & WROUGHT IRON TANKS FOR DITTO;

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS, VALVES;

IMPROVED WROUGHT-IRON RETORT-LIDS, CROSS-BARS, & SCREWS;

AND GAS APPARATUS OF EVERY DESCRIPTION.

SOLE MANUFACTURERS OF LIVESEY'S PATENT GASHOLDER MAN-LID,

By use of which Man-lid, inlet and outlet pipes can be examined and cleansed without loss of gas in crown of holder, or ingress of atmospheric air.

ROOFS, GIRDERS, BRIDGES, AND BOILERS OF ALL KINDS.

Drawings, Specifications, and Estimates supplied on application.

London Agent: W. G. DAVIS, 2, BRABANT COURT, PHILPOT LANE, E.C.

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WELLINGTON TUBE-WORKS, TIPTON, STAFFORDSHIRE,

MANUFACTURER OF

EVERY DESCRIPTION OF TUBING, GAS, STEAM, HYDRAULIC TUBES AND FITTINGS,
EITHER BLACK, GALVANIZED, OR ENAMELLED HOT WATER TUBES AND FITTINGS,
CORE BARS, COILS, COCKS (IRON OR BRASS),
CHANDELIERS, &c., GAS-FITTERS' TOOLS, GAS TONGS, STOCKS, TAPS, DIES, &c., &c.,
HANDRAIL TUBINGS, IRON AND BRASS, PLAIN OR TWISTED,
TELEGRAPH TUBES OR POLES, &c., &c.

Established

1795.

JOSEPH CLIFF & SON,

THE ORIGINAL

WORTLEY FIRE-BRICK WORKS,

NEAR LEEDS,

MANUFACTURERS OF ALL DESCRIPTIONS OF

FIRE GOODS, and Salt-Glazed Drain-Pipes.

LONDON WHARF:

Wharf No. 4, inside Great Northern Goods Station, King's Cross, N.;

LIVERPOOL—1, Back Leeds Street,

Where is always kept a Stock of Retorts, Fire-Bricks, Terra Cotta Ware, and Drain-Pipes.

HODGE & CO.'S

IMPROVED VENTILATING SUN-LIGHTS

WITH TALC REFLECTORS AND SELF-ACTING VALVES

TO PREVENT DOWN-DRAUGHT;

VENTILATING GLOBE LIGHTS for DINING-ROOMS, LIBRARIES, &c.

Ormolu, Bronze, & Crystal Gaseliers;

MEDIÆVAL CHURCH WORK AND CORONÆ

COCKS, VALVES, and FITTINGS for GAS, STEAM, and WATER;

COLUMNS, BRACKETS, & STREET LANTERNS;

BLACK AND GALVANIZED BARREL COMPO AND TIN PIPE.

GAS ENGINEERS,

100, HATTON GARDEN, LONDON.

Drawings and Prices upon application.

THE

IMPERIAL METER COMPANY,

LIMITED,

KING'S ROAD, LONDON, N.W.,

OFFICE: 9, VICTORIA CHAMBERS, WESTMINSTER, S.W.,

MANUFACTURERS OF

"WET" & "DRY" GAS-METERS IN IRON & TIN-PLATE CASES,

STATION-METERS AND GOVERNORS, STREET-LAMP METERS, BOXES, AND REGULATORS FOR THE AVERAGE METER SYSTEM.

TO GAS COMPANIES, ENGINEERS, &c.

These Works are in full operation, and it will be the aim of the New Company not only to keep up the excellent workmanship of their predecessors, but, by the introduction of special machinery, to manufacture **Meters of a higher standard than is usually given, without increasing the cost.**

Special attention is invited to the Compensating Wet Gas-Meter of De Castro and Burton, which is now becoming so generally adopted, and is more simple in construction than any other Compensating or Ordinary Wet Meter. There is but one centre of friction to be overcome by the gas. By its self-adjusting principle it maintains an unvarying water-line; and the reservoir contains sufficient water to supply the Meter for twelve months without attention. It is unaffected by "tilting," and cannot be "flooded" by any pressure.

The Company also manufacture Dry Meters upon the most improved principle, and all their Meters being made to standard gauges, the most accurate measurement is obtained.

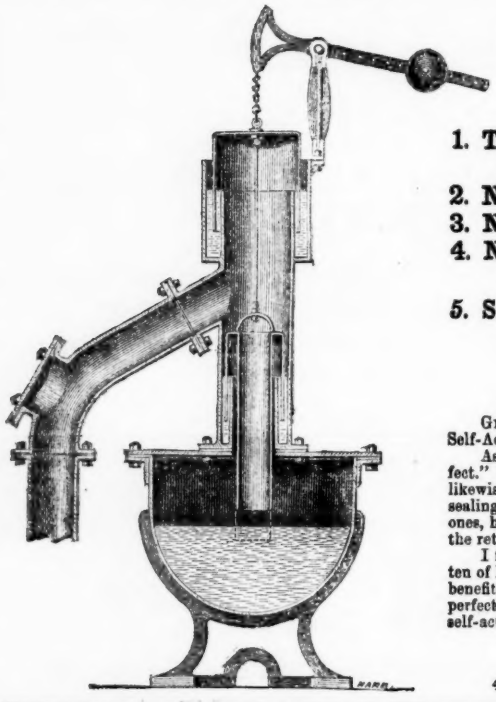
Attention is also called to their Dry Meters in Wood Cases, as used by some of the London Gas Companies. These Cases are a great preservation to Tin-plate Meters, especially in seaport towns, where the air is impregnated with salt; they are also particularly suited for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

TESTIMONIAL.

Metropolitan District Asylum, Caterham, Surrey, Dec. 14, 1874.

MESSRS. CHANDLER AND STEVENSON.

GENTLEMEN,—I have much pleasure in bearing testimony to the complete working of your "Patent Self-Acting Dip-Pipes," which have now been in constant operation over three months.

As regards the action of the apparatus, I can describe it no better than by calling it "simply perfect." Immediately the retort is charged and the lid secured, the small holder rises, which lifts the Dip; likewise the instant the gas is permitted to escape at the mouthpiece the holder falls, thus perfectly sealing the Dip. I am fully convinced of the superiority of these Self-Acting Dips over Non Self-Acting ones, having experienced the fact that stokers do occasionally neglect to unseal the Dip after charging the retort, thereby causing a waste or loss.

I feel that it is quite unnecessary for me to say more on the subject, excepting that, having had ten of Messrs. Chandler's Dip-Pipes in use more than one year, and having experienced the great benefits derived thereby, inasmuch as the yield of gas from the coal is greatly increased, and the retorts perfectly free from carbon and other advantages, and seeing that the same Dip has been made perfectly self-acting by the second patent, I feel convinced that this is the right thing.—Yours obediently,

W. CRICKMAY, Resident Engineer.

For terms of use and cost, apply to Mr. G. W. STEVENSON,

4, WESTMINSTER CHAMBERS, VICTORIA STREET, S.W.

MESSRS. CHANDLER & SONS,

Gas Engineers, Patentees, and Contractors, Triennial Contractors to Her Majesty's Government,

UNDERTAKE THE

ERECTION OF GAS OR WATER WORKS;

CONTRACTORS FOR PIPE-LAYING AND GAS-FITTING.

SOLE MANUFACTURERS OF THE CHANDLER AND STEVENSON PATENT SELF-ACTING DIP-PIPE.

ESTIMATES FURNISHED FOR EXTENSIONS OR ALTERATION TO EXISTING WORKS.

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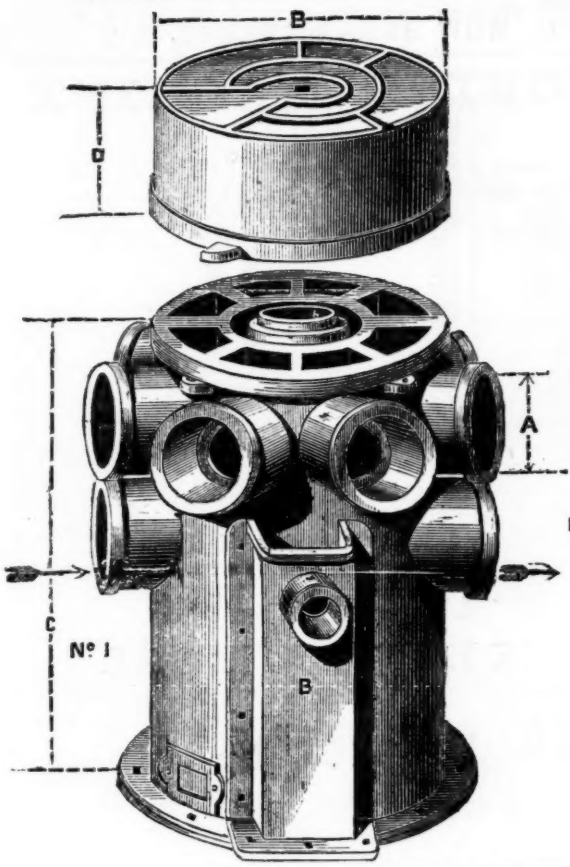
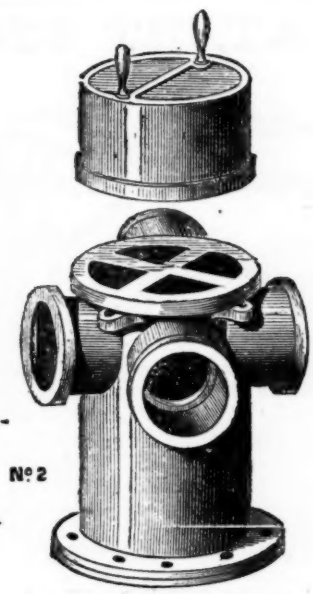
MESSRS. NEWTON, CHAMBERS, & CO.,

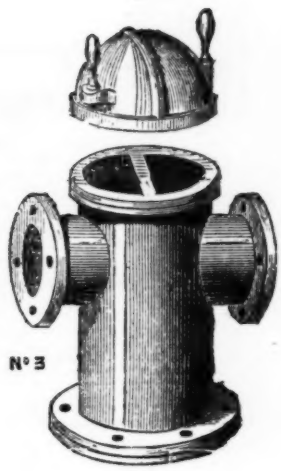
THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.

IMPROVED CENTRE-VALVES.





THORNCLIFFE
IMPROVED BYE-PASS VALVE.
SIZES FROM 3 INS. UPWARDS.



THORNCLIFFE
IMPROVED STOP-VALVE
SIZES FROM 3 INS. UPWARDS.

Sizes of the THORNCLIFFE IMPROVED CENTRE-VALVE.

	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.
A. Bore of Pipe. . .	4 ..	5 ..	6 ..	7 ..	8 ..	9 ..	10 ..	12
B. Diameter of Body.	16 ..	20 ..	23 ..	26 ..	28 ..	31 ..	34 ..	40
C. Height of Tank .	33 ..	35 ..	38 ..	43 ..	46 ..	48 ..	51 ..	56
D. Depth of Cover .	8 ..	9 ..	10 ..	11 ..	12 ..	13 ..	14 ..	16
Total Height . .	44 ..	44 ..	48 ..	54 ..	58 ..	61 ..	65 ..	72

In all cases the Covers are cast heavy enough to resist any required pressure.

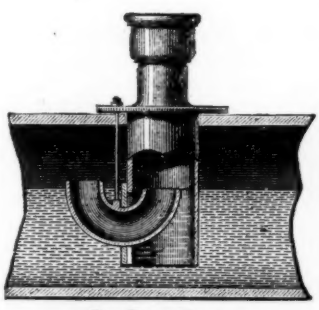
The advantages derived from the adoption of these Valves are so manifest and cardinal that in the immediate character of the change—the simplicity of the machine—the facility affording for cleaning out connexions between Valve and Purifier—the perfect collection and delivery by suitable overflow of the ammonia, at a greatly diminished depth from ground-line over the old form of Valve—the advantage of connecting on the same level, and at any angle, or opposite to each other, the inlet and outlet pipes without dip or rise—the clear acquisition of space in the purifying-house, by being able to place the boxes nearer together, the new Valve being entirely under the floor—and lastly, though of the greatest importance, the passage of crude and unpurified gas during the change is minimized to the merest fraction, thus preventing the fouling by impure gas the delicate machinery and easily affected exposed movements of the station-meter, thereby preventing the introduction of the enemy (unpurified gas) into the gasholder. Also a dead abutment is offered to all back pressure, imparting thereby to the gauges, governors, and hydraulic seals, a steadiness of action never realized with the once famous, but now fast becoming obsolete, Hydraulic Centre-Valve.

N., C., and Co. also Manufacture and Erect

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.



DIP-PIPE, No. 1.

Messrs. N., C., and Co. are also the Sole Agents for

HAWKINS' PATENT SELF-ACTING HYDRAULIC DIP-PIPES.

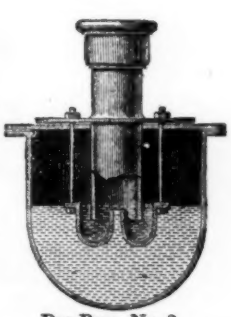
By their use the whole of the pressure caused by the Seal in the Hydraulic Main is entirely avoided, thus securing the many advantages long sought for.

Over 50 Gas Companies have already been supplied with them, many of which have been using them throughout their entire works continuously for over two years.

They can be applied to existing Hydraulic Dips, and at a very small cost.

They seal themselves in the same manner as the ordinary dip-pipes, therefore they are not likely to get out of repair.

By the aid of the adjusting screws they can be made to work on the old principle at pleasure.



DIP-PIPE, No. 2.

FOR PRICES, TESTIMONIALS, &c., APPLY TO

Messrs. NEWTON, CHAMBERS, & CO., Thorncliffe Iron-Works, near Sheffield, Sole Agents;

OR TO THE PATENTEE,

J. G. HAWKINS, NEEPSEND GAS-WORKS, SHEFFIELD.

THE FARNLEY IRON COMPANY, LIMITED,

FARNLEY, near LEEDS,

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

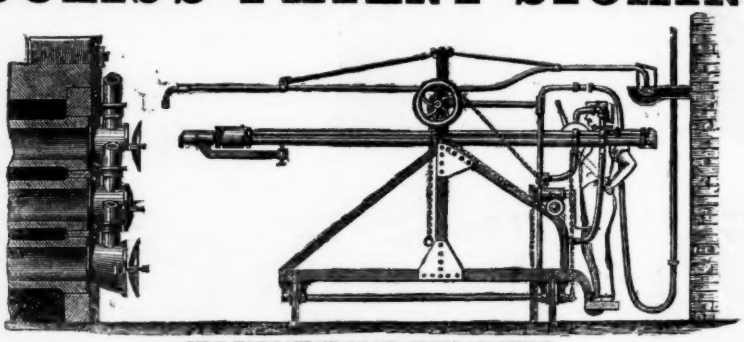
Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

The F. I. Co. have the exclusive right to make and sell Fraser's Patent "Ribbed" Gas-Retorts in Fire-Clay.

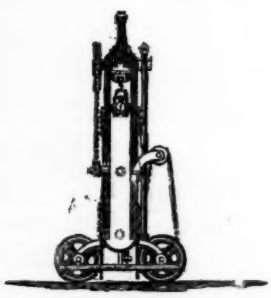
In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

Apply as above, or to the London Offices, 15, NEW BROAD STREET, E.C.

FOULIS'S PATENT STOKING MACHINE.



SIDE ELEVATION OF DRAWING MACHINE.



END ELEVATION.

(The Charging Machine will be Illustrated in next week's Advertisement.)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz; Or all particulars may be had from JAMES WOTHERSPOON, 31, St. Vincent Place, Glasgow.

ALDER AND MACKAY,

GRANGE WORKS, EDINBURGH,

MANUFACTURERS OF

CONSUMERS IMPROVED GAS-METERS;

IMPROVED DRY GAS-METERS, in Cast-Iron and Tin Cases,

OF THE HIGHEST EXCELLENCE,

Warranted to measure correctly, and not to vary.

STATION METERS AND GOVERNORS,

EXPERIMENTAL METERS, PHOTOMETERS, GASHOLDERS, &c.

MANCHESTER EXHIBITION OF SCIENTIFIC INDUSTRY — GOLD MEDAL — 1875

SIDNEY LEONI & CO.,

GAS ENGINEERS,

Patentees and Manufacturers of Registered Apparatus for Cooking and Heating by Gas, Complete Kitcheners for Families, Hotels, Clubs, &c. Ovens for Baking and Roasting. Grillers for Broiling. Boilers and Steamers for general use. The New Patent Tubular Safety Gas Boiler; also Heating and Ventilating Stoves, besides other Culinary and Warming Apparatus of their invention, and for which they have been awarded Prize Medals in 1871, 1872, 1873, and 1874.

They have also just been awarded by the Jurors of "The Exhibition of Appliances for the Economy of Labour," now being held at Manchester, the

GOLD MEDAL

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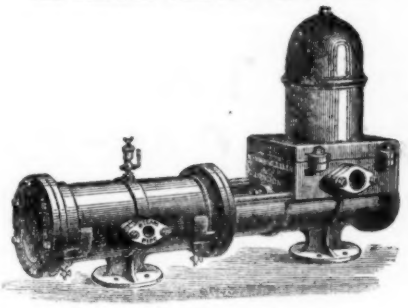

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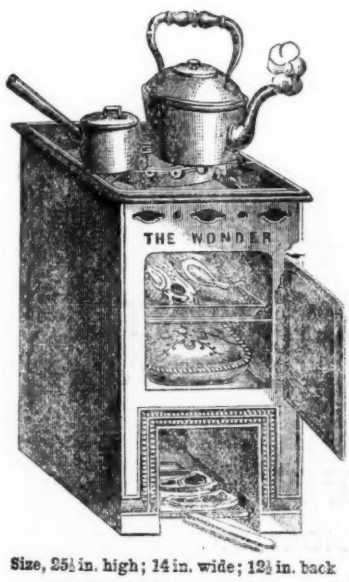

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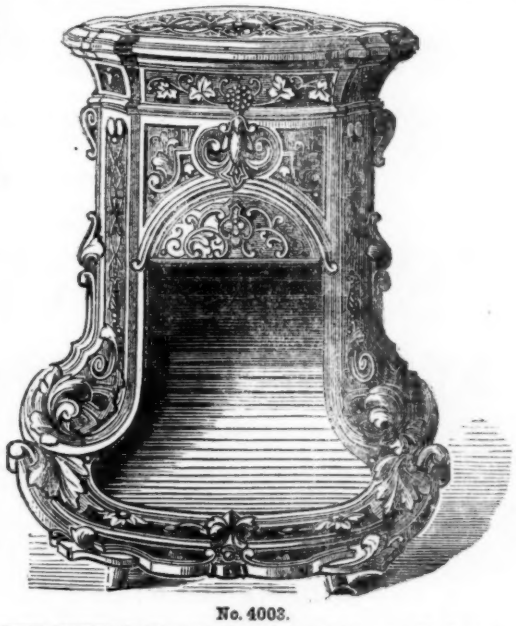

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 19, 1875.

Circular to Gas Companies.

We have to-day the great satisfaction of being able to announce that the directors of the Chartered and Imperial Companies have resolved to recommend their respective shareholders to amalgamate the two undertakings forthwith. The reply of the shareholders cannot be doubtful. Nothing can be lost, while very much may be gained, by the union. The two companies are, in every respect, so much on an equality, that they were clearly marked out for combination on equal terms.

We need not speculate on the consequences, immediate and remote, which will follow this amalgamation of the two companies, whose united capitals amount to two-thirds of the whole invested in metropolitan gas undertakings. That a further combination will quickly ensue may be deemed certain. The difficulties in the way of a complete amalgamation cannot, however, be disguised. In connexion with every company, there are some whose positions depend on the maintenance of the autonomy of the company. All chairmen of directors cannot be *the* chairman, every secretary cannot be *the* secretary, nor can every engineer hold the most important post of chief engineer to the amalgamated undertakings. And, truly, human nature is such, that men are only too apt to pursue their private ends rather than the general welfare. We lay no blame on them; but there are times which demand sacrifices. No great sacrifice, however, is required from any one to-day. Employment would bring full emoluments; retirement would involve compensation. The grievances would be either sentimental or selfish, neither deserving of pity. And then it may be urged that a general amalgamation would bring about many fewer immediate changes than a purchase of the undertakings by the authorities. For this reason alone, amalgamation should be preferred to purchase, by any who consider that their personal interests would be imperilled by a change. It is not necessary to pursue this subject further to-day. The satisfaction we have expressed at the union we have announced, will, we are certain, be generally shared by gas proprietors. No doubt there will be an outcry in some quarters. We shall be told again that amalgamations have been detrimental to the interests of consumers, a statement of which no proof has been attempted. Gas rose in price all over the country for a very natural reason; but it serves the purpose of some to assert that one especial cause of the dearness in parts of London was the amalgamations which had been effected. This view, however, is not shared by the Government, who, we believe, urge, more strongly than ever, the duty and policy of a general combination.

We have received a copy of an anonymous circular, which, we presume, has been distributed among the shareholders of the South Metropolitan Company, in anticipation of the general meeting to be held on Nov. 1. The object of the writer, who subscribes himself "A Shareholder," is to enlighten his co-proprietors on "the relation of the Metropolis Gas Bill, 1875, to "the position and prospects of the South Metropolitan Gas Com-"pany;" the object, of course, being to show that the Bill of the authorities offers peculiar advantages to this particular company. We pointed this out from the first, and suggested that, to place the companies on anything like equal terms as to dividends, a lower standard price should be fixed for the South Metropolitan. The Metropolitan Board caught at the suggestion, and made the proposal, but dropped it as soon as made.

To return to this circular, however. The writer sketches the course of gas legislation from 1842 up to the present time. The South Metropolitan were incorporated in 1842, and were one of the first companies restricted to 10 per cent.; but they had power (worthless at the time) to make up any number of back dividends. Then came the general Act of 1847, which limited all subsequently incorporated companies to 10 per cent. And here we may stop a moment to remark how thoroughly this limit of 10 per cent. has, so to speak, permeated the gas world. We have still a host of unincorporated companies entirely unrestricted, but we venture to assert that almost all these fix their prices with a view to make 10 per cent.

The Act of 1860, next alluded to by the writer, changed the aspect of gas affairs in the metropolis. Companies who had paid no dividends soon became prosperous, and all, for a time, went well. Prosperity, however, soon excites envy, and thus came inquiry after inquiry, and the eventual passing of the City of London Gas Act, 1868. This introduced a new principle. It was, we are told, laid down as an axiom that companies who exercised due care and management in the conduct of their affairs were entitled to [and were guaranteed] 10 per cent. The guarantee was the revision clauses, which were brought into operation on the applications of the Chartered and Imperial Companies. The result of these applications satisfies the writer of this circular, that it is almost absolutely impossible to judge whether or not "due care and management" have been exercised in the affairs of a gas company. Well, we may admit that a barrister, an accountant, and a chemist might find it difficult to come to a decided opinion on the point; but, then, we know that there are persons who would have no hesitation in coming to a conclusion. The writer, we think, should have complained of the tribunal, and not of the law; but, in saying this, it must not be supposed that we admit that due care and management were not proved by the companies implicated.

Unsuccessful suitors always believe the law unjust, and thus arose an agitation which, to make our story short, culminated in the production of the Metropolis Gas Bill this year. Now, the provisions of this Bill, the writer finds no difficulty in showing, are peculiarly favourable to the interests of the South Metropolitan Company; and, we may add, distinctly inimical to the interests of other companies. We have so often shown in what way it benefits the South Metropolitan, that we need not repeat the statements in this circular.

The writer says that the standard price of 3s. 9d., fixed by the Metropolis Gas Bill, "is very fairly assumed to be a practical "test of due care and management." Now, if the statement made in the circular, that the price of coal should have little or no effect on the price of gas, the assumption is altogether fallacious. In fact, 3s. per 1000 is the fair and practical test in the case of the South Metropolitan Company, and 2s. 6d. with the British Company at Hull, and the Bath, Plymouth, and some other companies. It is perfectly absurd to fix a price, and call it a test of due care and management.

We have only the last paragraph of the circular now to refer to, and our remarks will be brief. It starts with the assertion that Parliament has the power and the right to revise its own enactments. So, we may say, has the Sultan of Turkey, who has just exercised them in a way not agreeable to investors. If Parliament were to repudiate the bargain made with the companies in 1868-9, they would do nothing more nor less than has been done by the Sultan of Turkey. The circular goes on to say that Parliament is bound to see that the interests of consumers are

protected, as well as companies, and asserts that that has not been done for consumers. Parliament cannot do everything. It limits companies in dividend and price, and leaves the rest to their sense of justice. That this may be safely depended upon, is shown by the fact that there are very few companies in the kingdom now charging their maximum price. Lastly, the circular asserts that "this measure (the Metropolis Gas "Bill), if it *seems* to take something from the companies, it "*certainly* gives them an equivalent, and Parliament cannot be "charged with a breach of faith." Now, in connexion with some companies, the position of the words *seems* and *certainly*, should be changed in the above sentence. It would then express the truth, and read: "It *certainly* takes something, "and *seems* to give an equivalent." In conclusion, we may say that, in the interest of all gas proprietors, we object to the exchange of a fixed for a speculative dividend. With the sliding scale, the value of gas property would be always fluctuating. At present it forms one of the most stable investments at command, and we earnestly hope it will remain so.

We said so much last week, that we shall not occupy our space to-day with further remonstrance against the proceedings supported in this circular. We are not entirely without hope that good feeling will at last prevail, and that the shareholders will be content with the present position of the company. They would be so if they have only the interest of the consumers at heart.

We publish in another column the quarterly report of the chief gas examiner for the metropolis. It shows, as usual, that the companies are displaying the utmost liberality. The illuminating power has in every instance been very considerably in excess of the statutory requirements. As regards purity, a much more difficult business, there is little of which to complain. A slight trace of sulphuretted hydrogen on a few occasions, and a small excess of "sulphur" on one or two, can hardly constitute a grievance. The appearance of the former impurity for two consecutive days can hardly be excused, but we are bound to believe that a satisfactory explanation of the circumstance was offered to the chief examiner. The most serious default would seem to lie with the Metropolitan Board, whose officer at one station appears to have tested the gas only on one-half the days in the quarter. This is not what the public desire, nor what the gas companies wish.

The Local Government Board have issued to local authorities a circular, explaining the provisions of the Public Health Act of last session. We have before referred to the provisions which relate to gas, but may here briefly recapitulate them. Urban authorities may now, with the consent of the Local Government Board, expressed by the grant of a Provisional Order under the Gas and Water-Works Facilities Act, start a gas undertaking when none exists within their district. An urban authority may also, again with the consent of the central authority, purchase the undertaking of any company supplying the district; and powers of sale, subject to all liabilities, are given by the Act to all gas as well as water companies. The vexed question as to the possibility of allowing an urban authority to start competing works is, of course, not treated of in this circular, which, as we have said, only deals with the provisions of the Public Health Act. No doubt, if propositions of the kind were made, the central authority would consider every case on its merits; but the circumstances must be extraordinary indeed under which permission would be given to expend public money in competition.

We have to correct a statement made in our last with respect to the reduction of the price of gas in Manchester. The reduction is to take effect in the out-townships as well as in the city; but this still leaves the suburbs with a differential rate of 8d. per 1000. We have been favoured with a copy of the report and accounts of the Gas Committee, but have not space for them this week. They will appear in our next, with what comments they may suggest. One word to-day, however, in reply to an esteemed correspondent. We object altogether to the financial principles on which the Manchester gas undertaking is managed, and so long as the present system is persisted in, we must continue to regard the gas consumer as an overtaxed man. We quite believe that "the consumers of Manchester gas are as favourably "dealt with as those in neighbouring towns, where the works "have not yet been assumed by the local authorities." But that is not the question. Are they as favourably dealt with as the circumstances of the Manchester Corporation will allow? Are they not, in fact, taxed for improvements in which they have no more interest than those who escape the tax? Our contention has always been, and always will be, that a gas undertaking in the hands of a local authority should pay its legitimate expenses, and no more. An improvement-rate should be levied under its proper designation.

Strange news comes from Ryde. The accounts of the gas company have been filed as usual, and the Corporation have come to a knowledge of the fact that the profits of the company are increasing. When the Town Council gave notice of their intention to treat for the purchase of the undertaking, the average profit of the three previous years amounted to £2300, and on this basis the price was fixed. Last year the company made £2820. Hence arises in the council a lamentation that the purchase was not completed. If it had been, even at the amount of the award, it is now said that the public lights at the present time would not be costing the town a halfpenny; and that at the existing rate of progress the profits of the undertaking at the end of fifteen years would have extinguished the General Purposes Rate. It is a great pity that the council did not take the advice we gave them at the time. Besides having made all the profit as above, they would have saved themselves positive disgrace, and the ratepayers heavy costs to keep bailiffs out of their council chamber. All in the council, however, do not see things in the same light as Alderman Dashwood, and some expressed an opinion that competing works should be started. The assurance of the mayor that this could not be done, was answered with the polite request that he would "tell that to the "marines," and thus the discussion ended.

On Friday last, Mr. Cyrus Legg in vain attempted to obtain a return of the expenses incurred by the Metropolitan Board in promoting and opposing Bills in the last session of Parliament. A return of the money expended for such purposes, during the last five years, has been ordered by the House of Commons, and, it seems, is now in preparation. This return, however, we imagine, will not include the costs incurred in the present year. It was suggested by a member that the information was wanted for the gas companies. Unhappily, gas companies, and particularly the metropolitan companies, are so well acquainted with the cost of parliamentary proceedings, that they will be able to make a pretty accurate guess at the amount expended in connexion with the Gas Bills. The ratepayers, we are inclined to think, would much prefer the real figures to the crude results of Mr. Newton's inquiries, and we fail to see why they should not have the information.

Accidents, we know, will happen in the best-regulated families, and in gas-works also; but shutting off the entire supply of gas from a town—and this has recently happened at Colchester and Swansea—for ever so short a time, looks more like a result of ignorance than accident, and suggests that men entrusted with the manipulation of valves should be thoroughly educated in the duty, before they are left to the exclusive performance of it.

Water and Sanitary Notes.

The eleventh annual report of Dr. Angus Smith, the chief inspector under the Alkali Acts, 1863, 1874, has just been issued, and it is gratifying to find that the former Act continues to work with advantage. The more recent Act of 1874 is now in force, and manufacturers are subjected to more stringent regulations, which we are happy to see they are making every endeavour to meet. By the first-named Act, it was required that 95 per cent. of the hydrochloric acid evolved in the manufacture of soda from common salt should be condensed, and not allowed to pass into the atmosphere. The later Act (1874) continues to require the condensation of the 95 per cent. of acid, and further enacts that the chimney gas shall not contain more than one-fifth of a grain of acid in each cubic foot. To comply with this restriction, it is certain that important structural alterations will have to be made in many works, for a glance at the tables in this report shows that at some of the best the limit is rarely maintained. A condensation of 95 per cent. of acid seems to be easily kept up, for the tables show that it is seldom less. The problem will henceforward be how to get sufficient air through the flues and chimney to bring the acid to the required state of dilution, so that a cubic foot of gas escaping shall not contain more than one-fifth of a grain. There will be some tax on the ingenuity of the manufacturers, who will, no doubt, soon accommodate themselves to the new circumstances. They are placed somewhat in the predicament of gas engineers, who are required to keep sulphur below a certain amount, and are not yet acquainted with the best means of effecting that object. "No cause could be "discovered for this excess," is an occasional remark of the district inspectors, which seems to show that there are irregularities even in acid condensation, which cannot yet be explained.

Successful as we consider the working of the Act of 1863 to have been, it must be admitted that not so much has been done as some expected. St. Helens does not yet "blossom as the rose"—her orchards are not restored; and the neighbourhood of Widnes is, as regards vegetation, almost a wilderness. Dr. Smith, however, pleads that it was not the duty of him and his colleagues to cause crops to grow; it was their duty to cause the works not to send out more than 5 per cent. of muriatic acid. "And this has been accomplished in the full sense." Great

torrents of acid vapours no longer roll over the country; but then it is remarked that vegetation is destroyed without torrents. To obtain flourishing vegetation we must avoid even small portions of gas. Thus, Dr. Smith almost destroys our hope that much good will come of the Act of 1874. If vegetation is to flourish around chemical works, it would seem that every trace of acid must be prevented from escaping. We are far from thinking that this will not be accomplished in a not distant future; but at present it is impossible. The question then arises, which is of most value to the community, flourishing chemical works, or some acres of grass, with fruit trees and flowers? Our trade returns will supply the answer. "The progress of the community and of chemical manufactures," says Dr. Smith, "must go on together, and it may be considered certain that prosperity will endure more pressure, since prosperous men are more ready to complain, and more able also to remove the cause of the complaint." We are not quite certain of the meaning of the latter part of this sentence; but we may admit that a prosperous manufacturer must have capital to expend on improvements. The chemical trade, however, is not always prosperous, and care must be taken that over legislation does not injure an industry which is now the third in importance in the country.

We have passed by a suggestion for future legislation, which, however, deserves a remark. Dr. Smith seems to think that a fixed standard for all localities is a mistake. He would first determine the acidity of the air of the place in which it may be proposed to erect chemical works, and then fix the quantity of acid to be allowed to escape from the works, apparently by observations on the state of vegetation in the locality. This would involve many restrictions, the worst of which would be a limitation of the number of works in a given district. We are not certain, but we rather think that Dr. Smith would scatter the works. Now, apart from the economic reasons which have determined the localities in which alkali works have been placed, there is, we believe, another advantage in their aggregation. It is, we think, better to have their concentrated effects within limited districts, than to have weak acid vapours disseminated over large areas.

That some degree of concentration is not prejudicial to human existence, seems to be proved by some statistics given of the causes of death at Widnes, as compared with all England. We place very little reliance on what are called "vital statistics," but we use the figures for what they are worth. Briefly, then, the death-rate from consumption at Widnes is little more than half that of all England; the rate from bronchitis is sensibly lower than the general average; but inflammation of the lungs seems to kill about twice the average number for all England. We need only refer to lung diseases, which alone may be considered to be affected by acid vapours. Dr. Smith is of opinion that the gases from chemical works are hurtful to health, and the statistics quoted from, to a certain extent, support his view. In another place, however, he says that "the number of circumstances that influence the death-rate is great;" and, with the information at present before us, it would be presumptuous to form more than a provisional opinion.

A circular, from the Local Government Board, gives local authorities information as to the powers and privileges the Public Health Act confers on them in relation to water supply. Speaking broadly, the Act puts the authorities in much about the same position as incorporated water companies. It gives them, however, a certain control over private supplies. Thus they have power to close private wells, the water of which is alleged to be unfit for use, and especially in cases where the water is used for the manufacture of aërated drinks. Now, if we rightly remember, cases of lead poisoning have occurred in Glasgow, from the presence of that metal in aërated drinks made with Loch Katrine water. What is to be done in such a case?

Maidstone, without waiting to see what the provisions of the Pollution of Rivers Bill of next year may be, has decided to run its sewage into the Medway, after some clarification process. Bristol, more cautious, is disposed to wait before it decides on any plan for treating the sewage before it is passed into the Avon. The fact that in neither of the towns mentioned was any irrigation scheme seriously entertained, seems to indicate that the mania for sewage farms is subsiding. The Canterbury authorities are extending their sewage works, which are only designed for subsidence and filtration.

The Kingston Local Board have, it seems, abandoned their intention to erect works for carrying out the process of the Native Guano Company. We see no reason assigned but the remonstrance of neighbouring authorities.

Death of Mr. W. B. Emmerson.—On the 8th inst., at the house of his brother-in-law, Mr. C. Armitage, Drighlington, Mr. William Barnes Emmerson, engineer and manager of the Blackburn Gaslight Company, in the 34th year of his age. He was interred on the 12th at Wood House Cemetery, Leeds.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

LXIX.

Gasholders.

The store for the gas, or, properly speaking, the gasholder, in its simplest form is a cylindrical sheet-iron vessel open at the lower part, where it is immersed in water in a tank, and closed at the upper part, which is generally termed the roof or crown. This is almost invariably more or less domed, for the purpose of permitting the rain to flow freely therefrom; and when formed in the usual manner, with a rise in the proportion of one to twenty of the diameter, the roofs of small vessels are often self-sustaining.

Holders of small capacity, for the supply of manufactories, villages, or towns, are generally provided with counterbalance weights, suspended to the gasholder by chains at two or more points. By this means the weight of the holder, and consequently the pressure within the same, can be readily adjusted to any required degree. An economical consideration of importance in a gas-work is, to avoid excess of pressure, and, as the holder is the first cause of pressure, we repeat that, it should be so adjusted as to give little more than is required for properly supplying the locality.

In a popular work it is stated that, since the general introduction of the exhauster, gasholders, instead of requiring to be counterbalanced, are weighted, in order to give the desired pressure for the supply. This, however, cannot be correct, as the use of the exhauster does not lighten the holders; but whether there is an exhauster or not, it is desirable to reduce the pressure as much as possible.

Judging by the works executed by various engineers, the best method of making gasholders seems to be still considered a matter of uncertainty, as we find some of our ablest men constructing them in the simplest manner possible, and dispensing entirely with all trussing in the roof. On the other hand, there are engineers of reputation who adopt the very opposite course. Already we have given some instances of the former, as in the holder of 180 feet diameter erected by Mr. Livesey, and that recently mentioned, constructed by Mr. Bower, where the roof trussing is entirely dispensed with. It is not, however, in modern holders alone that this system has been adopted. It was applied 24 or 25 years in the holders of the Great Central Company at Bow Common, and more recently in one or more of the holders at the Pancras station of the Imperial Company. The system has, moreover, been introduced into a large number of other works, where economy was essential; and from inquiries made of manufacturers and engineers since last referring to the subject, we believe that there is not a single instance in which defects or weakness, arising from this mode of construction, have occurred.

For the purpose of inquiring into the necessity of trussing for roofs, let us consider for a moment the circumstances which control a gasholder. 1. When in action it contains a quantity of gas having a pressure or resisting force somewhat greater than that of the surrounding atmosphere. 2. The plates forming the roof weigh on the average, say, 4 lbs. to the square foot (those of small holders are less than this), and we will assume the pressure given by the holder to be 4 inches. Then, as this pressure is equal to 20·83 lbs. on the square foot, we have that force or power of the gas to sustain 4 lbs., the assumed weight of each square foot of the plates forming the roof. But, on account of a large portion of the roof being supported by the top curb, the weight of each square foot will be considerably less than this.

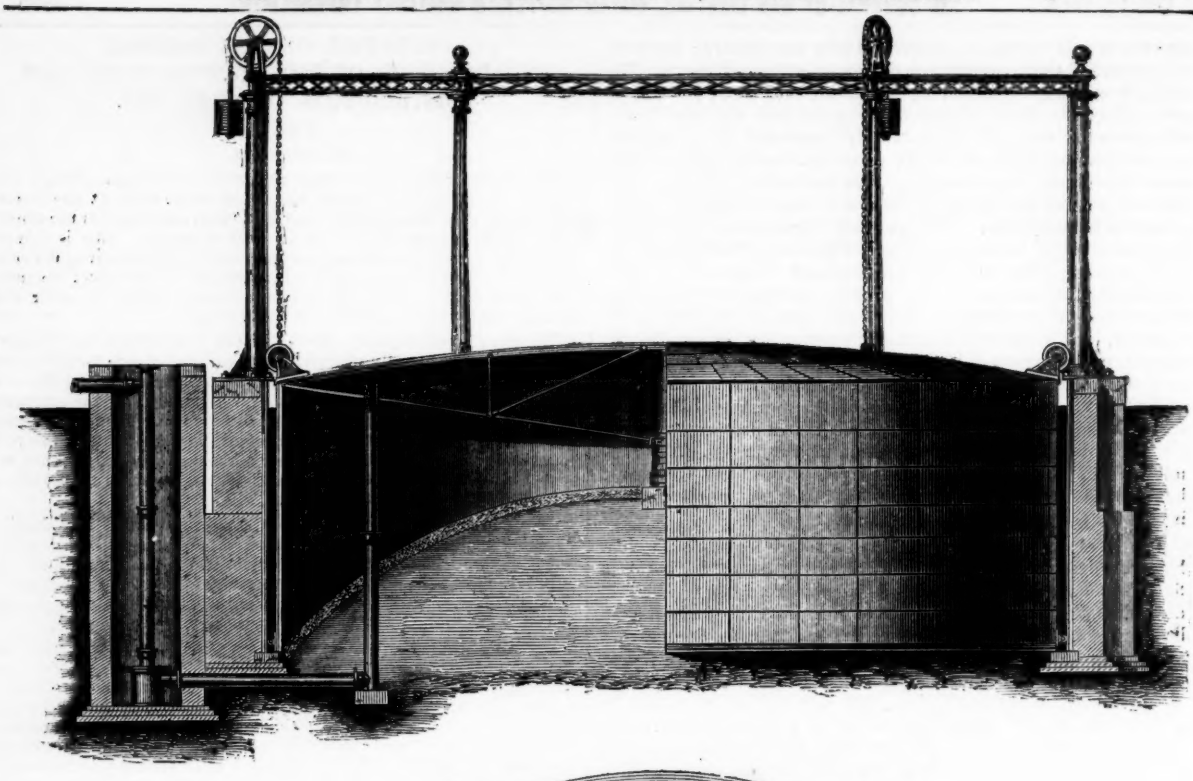
Under the conditions mentioned, we find the pressure of the gas on a given area to be about five times greater than the weight of the plates forming the roof. The question then arises, why is a heavy and expensive trussing placed to support that which the gas within can do equally as well, and, indeed, much better? For, although the plates repose on the trussing before the gas enters, on this occurring they are sometimes lifted two or three inches therefrom.

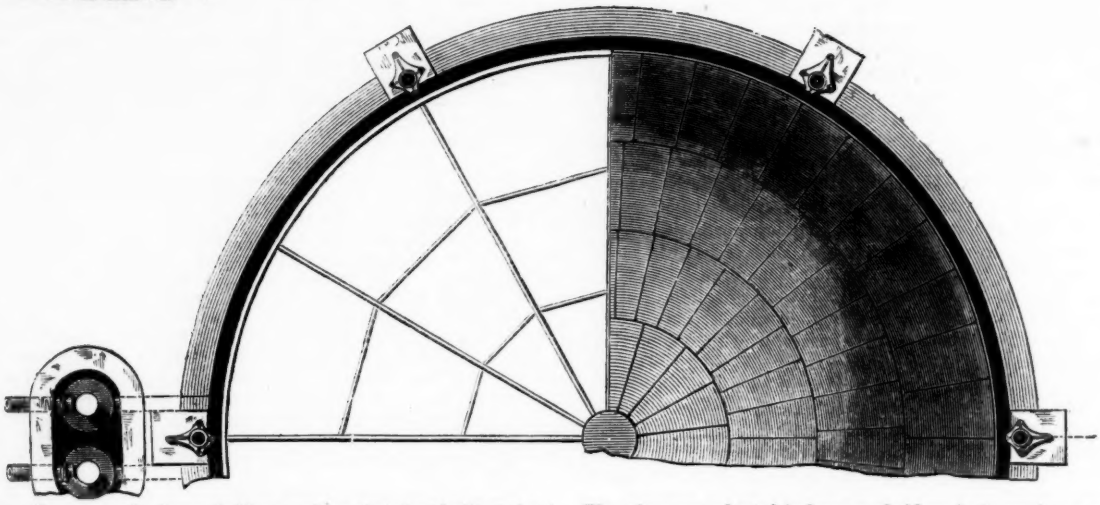
Again, other engineers make the roof trussing just sufficiently strong to support the plates whilst in the course of erection, and, if trussing be employed, this system, in our opinion, is the most economical, and answers every possible purpose, at least for vessels of limited dimensions.

In referring to the various opinions entertained on the principles of constructing gasholders, we may state that one engineer of eminence considers the main bars indispensable to retain the top curb in its form. Yet, according to others, the main bars may be altogether dispensed with, the upper curb being an annular space, square in section, and called the "box curb." Others increase the strength of the main bars and the trussing generally to such an extraordinary degree, as to remind us of the first attempts at constructing holders, when their interiors were supported by wooden and iron framing, as if to resist the influence of the external atmosphere.

It is well known, however, that in constructions where the capital is limited, and strict economy has to be observed, that holders are very frequently erected without trussing in the roof, and, as before stated, they fulfil every possible requirement.

Heavy trussing, particularly for holders of large diameter, becomes very expensive; it has also the disadvantage of increasing the pressure, by the additional weight of metal entering into its formation, and this signifies increased fuel for the exhausters to overcome the extra pressure, which in the course of a year becomes an item of consideration. Besides this, as the weight of the trussing is much above the centre of gravity of the holder, additional precautions are indispensable to prevent it "toppling" over from the action of the wind, for which purpose extra columns and girders are required. All these are strong arguments against the use of heavy trussing for holders





of large diameter. In large holders, such as that just built at the South Metropolitan works, unquestionably the trussing can be dispensed with, and a very considerable saving effected, for the cost of the timber framing in such a structure would be comparatively insignificant to the cost of the trussing that such a diameter and area would demand.

However, the absence of trussing in the roof is not all economy, for, when it is dispensed with, a wooden framing, corresponding in form with the crown of the holder, has to be built, and afterwards to be left, for supporting the roof when the holder "grounds," and the pressure of the gas is not sufficient to give the required support. In small holders we believe the best method is to have very light trussing, just sufficient to sustain the plates during the erection.

The modern method of supporting gasholders by means of columns differs widely from that employed 35 years ago, at which period the telescopic system began to be generally applied.

The telescopic holders then used were commonly 60 feet in diameter, and 36 feet high, supported at three points only, by double columns, each being about 9 inches diameter. These columns were mounted in pairs on the same base, and surmounted by the same capital. Two pairs of columns, superposed the one on the other, formed the supports for the girders, and carried the chains and pulleys for the counterbalance weights. They also served to carry the guides for the holder. Of these supports there were three, so that the space between them was upwards of 60 feet. Yet these apparently fragile structures, as compared with those of the present day, did good service; and, although we have known them to be subjected to a terrific hurricane, which uprooted young trees, they showed no signs of weakness, but remained as firm as could be desired. From this circumstance, we are disposed to believe that too much importance is generally attached to the action of the wind on gasholders. It is more probable that accidents arise from defects existing in the erection, which a strong gale of wind renders palpable, by causing some part to yield or break.

The plan now adopted in large gasholders is to employ a number of columns, situated at an average distance of about 20 or 24 feet, of which some engravings will be given hereafter. The unanimity of opinion in adopting these massive columns, and the limited distance from each other, must be regarded as a proof of the desirability of the system.

Already the rule has been given, whereby, having the pressure of the holder with the area of its roof, its approximative weight may be ascertained; or its weight and area being given, to find the pressure; or the pressure and weight given, to find the area. The rule is of great simplicity and utility in the varied departments of gas engineering.

With these general observations, we proceed to give a specification of a small holder, suitable for a factory or other large establishment, or very small town.

Specification of a Gasholder, 35 feet diameter and 14 feet deep at the sides.

Curbs.—The two curbs, top and bottom, to be of angle iron, 3 inches by 3 inches by $\frac{3}{8}$ inch, curved to a radius of 17 feet 6 inches, to be butted at the joints with proper lapping pieces, securely rivetted with $\frac{7}{16}$ inch rivets.

Sheets.—The sheets employed to be of best Staffordshire quality, all properly flatted before being punched. The sheets of roof and the top and bottom rows of the sides to be of the thickness of No. 14 Birmingham wire gauge, all the others to be No. 16 B. W. G. The sheets of the sides not to exceed 2 feet in width and 4 feet in length, from centre to centre of rivet holes. To be rivetted with $\frac{1}{2}$ inch rivets, one inch from centre to centre, a hempen cord, dipped in paint, being placed between the plates at the joints at the time of rivetting.

Crown Plate.—The roof of holder to be domed, and to rise a height of 1 foot 9 inches; the centre or crown plate of roof to be 3 feet in diameter and $\frac{3}{8}$ inch thick, having four bolt-holes for centre-pipe, twelve $\frac{3}{4}$ inch bolt-holes for securing the ends of main bars, and six bolt-holes for suspension rods. To have a wrought-iron ring, 3 feet in diameter and 4 inches wide and $\frac{3}{8}$ inch thick, with holes corresponding with those in the crown plate for securing the main bars.

Main Bars.—To have twelve main bars of T-iron, $2\frac{1}{2}$ inches by 2 inches by $\frac{1}{4}$ inch. The upper ends to have clips and eyes, to be secured with $\frac{3}{4}$ inch bolts to crown plate and ring, their lower ends being in like manner secured to top curb.

Centre-Pipe.—The centre-pipe to be of cast iron, 6 feet long 4 inches diameter and ½ inch thick, to have two flanges 3 inches wide in the clear. The upper flange to be bolted with four ¾ inch bolts to the crown plate. The lower flange to be bolted in like manner to the cast-iron truss cup, which is provided with six holes to receive the ends of the tension rods.

Trussing.—To have six tension rods, each ¾ inch in diameter, with long screw and nut at one end, the other end being formed with an eye and secured by a ¾ inch bolt to end of main bar and curb, the bolt passing through the three. To have six suspension rods, each ½ inch diameter, secured at one end by eye and ¾ inch bolts to crown plate. The lower end having also an eye through which the strut passes. The strut to be 1¼ inch diameter, the upper end being jawed and secured to main bar by ½ inch bolt, the lower end to have long screw, which is secured to tension and suspension rods by two nuts, the one above, the other beneath. To have two rows of bracket bars or purlins, rivetted between the main bars with ⅝ inch rivets. The outer row to be of 2 inch by ¼ inch angle-iron, the inner row to be of 1½ by $\frac{7}{16}$ inch angle-iron.

Man-hole.—To have a man-hole ring 1½ inch by ⅝ inch, of 20 inch by 14 inch internal measure, to be rivetted and manhole cut where desired; to have cover with ring and the necessary ⅝ inch screws.

Rivets.—The rivets for the sheets to be ¼ inch diameter, and 1 inch apart from centre to centre. The rivets for the top curb to be ⅝ inch diameter, and 1½ inch apart from centre to centre. The rivets for the bottom curb to be ⅝ inch, and 4 inches apart.

Chairs and Rollers.—To have four chairs, with corresponding grooved rollers for guiding the holder.

To have four plates, ⅝ inch thick, of the dimensions of the base of the roller chairs, these to be attached to the roof opposite each of the columns, and to these plates are secured the chains.

To have four rollers and frames, to be attached to bottom curb for guiding the holder.

To have four wrought-iron guides, each 14 feet 3 inches long, ¼ inch thick, and 5 inches wide, with lugs to build into brickwork.

Columns.—To have four cast-iron columns, each 15 feet 9 inches long, 7 inches diameter at bottom and 5½ inches at top, with capital at top and base plate at bottom, the base to have three holes cast therein for holding-down bolts, each column being provided with a vertical guide rib.

Holding-down Bolts.—To have twelve holding-down bolts, 1¼ inch diameter and 5 feet long, with nuts. Twelve cast-iron plates, 6 inches square and ⅝ inch thick, with 1½ inch holes in centre.

Pulleys.—On each column is to be placed a set of fixings and pulleys for the balance chains to work over.

Chains.—Four chains, each to be attached at one end to shackle fixed on holder, the other end being provided with a shackle and balance-weight rod.

Balance-Weights.—To supply 2 tons of balance-weights.

Girders.—To supply four girders of 3½ inch by 2½ inch by ⅝ inch T-iron, attached to and connecting the tops of columns to each other, to be trussed with 1 inch strut 1 foot 6 inches long, with ⅝ inch suspension-rods.

Pipes.—To supply outlet-pipes and syphon, 5 inches internal diameter, and inlet-pipes and syphon 4 inches diameter, with their corresponding duck-foot bends.

Valves.—To supply one 5-inch valve; one 4-inch valve; one 5-inch flange T-piece: and one 4-inch flange T-piece.

Painting.—The whole of the wrought ironwork to receive two coats of paint before leaving the works of the constructor. The contractor to supply all material, labour, scaffolding, tackle, and other apparatus necessary for the erection of the gasholder, and to erect the whole, together with the column and girders, in a good and substantial manner.

The price of a gasholder similar to that described, erected in a locality where no extraordinary expenses are necessary for transport, would be about £260.

The first of the accompanying engravings represents a holder, 40 feet in diameter, and 15 feet deep, with its corresponding brick tank and dry well, shown partly in section, and partly in elevation. The tank is domed at the centre, which has a layer of concrete over the whole of its surface, and this is afterwards rendered with Portland cement. In the centre is a brick pier, on which reposes the truss-cup; by this means the strength of the roof trussing may be reduced to a very considerable extent. The form of the interior of the tank, although, in some cases, slightly more costly in its construction than the flat-bottomed old-fashioned kind, possesses the advantage of greater strength. In some places, where the ground is hard, this form, however, will be found as cheap in construction as the other; and, should rock exist, it will be a consideration of economy to leave as large a mound as possible in the centre.

The gasholder is constructed in a similar manner to that described in the specification, having, however, six columns instead of four, to three of which counterbalance weights are suspended. The girders are represented as latticed, which have a very ornamental appearance, and, as they are of light construction in wrought iron, do not add very materially to the expense.

The other engraving represents half the plan of the gasholder and tank, with its dry well. One half the holder is shown covered with the plates; in the other is seen the method of constructing the trussing, all of which correspond with the specification given, although, of necessity, differing in dimensions.

(To be continued.)

SWANSEA GAS COMPANY.—We have received, too late for insertion this week, a report of the proceedings at the meeting of this company on Friday last. We intend to publish it next week; meantime we note with satisfaction that, the chairman having laid before the shareholders the nature of the conference with the deputation of the council on the 2nd inst., it was resolved that the company would be prepared to enter into a contract with the council for the public lighting for three years from Jan. 1, 1876, at the price of 3s. 3d. per 1000 cubic feet, being a reduction of 3d. on the present price, the charge for lighting, cleaning, and repairing the lamps being reduced from 22s. 4d. to 18s. per lamp per annum. The price of gas to private consumers also will be reduced from 3s. 9d. to 3s. 6d.

BEVERLEY CORPORATION GAS SUPPLY.—At the meeting of the Beverley Town Council on the 11th inst., the Gas Committee stated that they had had under consideration the plans submitted by the manager for necessary improvements at the works, the proposed outlay being £2000; but as there appeared to be considerable difficulty in obtaining a loan from the Local Government Board, the committee had directed the manager to confine himself to a report upon the best means of purifying gas on the existing principle in the most economical way. In the course of a discussion Alderman Crosskill took occasion to observe that the committee would probably be able to carry out the necessary improvements for the purifying of gas without applying for a public loan if they waited until next year.

Correspondence.

LONDON GAS COMPANY'S COKE SALES.

SIR,—It has been inferred, from your editorial remarks of Tuesday last, that you do not consider the revenue derived from coke sales of the London Gaslight Company for the past half year entirely satisfactory. As manager of that department, I hope you will allow me to demonstrate that the result is perfectly satisfactory.

From the opinions you have expressed in your JOURNAL, I have no doubt you will agree with me that the larger the stations of metropolitan gas companies, the less the price they may be reasonably expected to realize for coke.

The Chartered Company, with their immense station at Beckton, would usually realize the lowest price; followed by the Imperial Company, with the next largest producing station at Fulham.

On reference to Mr. Field's analyses for recent years, this will be found to be generally the case, and that the other metropolitan companies rank nearly in the reverse order to their magnitude, with the exception of the London Company, which has realized exceptionally good prices for two years past. It stood fourth on the list of nine companies last year in the price per chaldron, and first in the return per ton of coals carbonized.

The three largest companies have each several stations. The London Company, which is the fourth largest, has only one station; but that station is the third in magnitude, being next largest to the Imperial at Fulham.

It is disadvantageously situated for the sale of coke, being near, and in competition with, the largest station of the Phœnix Company at Vauxhall.

It follows from this that the natural place of the London Company on the list is next to the Imperial in lowness of price.

I now furnish a statement of the results of the past half year, so far as they can be gleaned from the returns printed in your JOURNAL. I have omitted the Surrey Consumers Company, they not having published quantities of coke or coals.

Half Year ending June, 1875.

	Net Produce of Coke per Chaldron.	Gross Produce of Coke per Chaldron.	Gross Produce of Coke per Ton of Coals carbonized.
Chartered	7s. 7·16d.	8s. 7·45d.	5s.11·04d.
Imperial	7 0·02	7 11·74	5 8·11
London	9 4·72	10 2·71	7 7·25
Phœnix*	8 8·15	—	—
Commercial	8 10·76	9 5·48	6 8·36
South Metropolitan	10 3·27	10 10·81	7 3·19

* Charges not particularized.

From this statement it will be seen that the London Company has realized the highest price per chaldron excepting the South Metropolitan, and higher than the South Metropolitan per ton of coal carbonized.

I attribute the good results our company has attained to the high reputation it has sustained for the quality of its coke, and to the sales being entrusted to one, and only one, competent person.

London Gaslight Company, Nine Elms, S.W., W. G. HEAD.
Oct. 14, 1875.

GAS-EXHAUSTERS.

SIR,—If you will allow your paper to be made a medium for supplementing the unfinished proceedings of the last session of the British Association of Gas Managers at Leeds, I will feel obliged.

The proceedings were unfinished because, on one paper that was read, I find by the report there was no discussion, and other papers were taken as read, and are now published by the association.

I am sure Mr. Cleland would have been pleased had there been a discussion on his interesting paper. I heard about one-half of it, but was compelled to leave to catch a train for London, or I would have asked a question or two.

I am a sceptic both as to the economy and the utility of steam-jet exhausters; and as they are so much more simple than any other exhauster with which we are acquainted, I am anxious to have my doubts removed.

First, as to the economy. Mr. Cleland states in his paper that, from special trials made in Germany, the jet exhauster requires (only) 5 lbs. of water per 1000 feet of gas passed per hour.

I wish Mr. Cleland had given us the results of trials nearer home, for I should like to have an opportunity of testing the accuracy of the statement. If he can furnish an English example, I wish he would, and in doing so state—1, the pressure of the steam employed; 2, the pressure of gas overcome; 3, the quantity of water converted into steam per 1000 feet of gas passed; and 4, where I can see the performance, should the figures approach the German experiment.

My opinion is, that if the pressure of the gas to be overcome is even of 18 inches head of water, it will require three times as much water to be converted into steam as has been stated; and if so, the ammoniacal liquor will be so weak as to be worthless.

I am also of opinion that, to reduce such a pressure, the quantity of steam required would so heat the gas as to interfere materially with condensation, and also with illuminating power, and there are other objections; but without those I have stated removed, I should not be inclined to adopt a steam-jet exhauster.

Westminster, Oct. 14, 1875. GEORGE ANDERSON.

SIR,—I have not yet seen the address of the president of the West of Scotland Association of Gas Managers (which will probably appear in your next number);* but, as regards the gist of it, as quoted in M.'s letter this week—namely, that "gas *exhaustion* is only in its infancy"—I beg to say that, if this alleged "exhaustion" be only in its infancy, I trust it will never get beyond it. In reality, there is no such thing as *exhaustion* in gas manufacture, as hitherto practised, and I hope there never will be. The name "exhausters," given to the apparatus in question, as employed in gas-making, is entirely a misnomer, and apparently a very misleading one. I presume that the cause of the misnomer was originally due to the fact that the apparatus was employed for pumping or exhausting purposes in the works or factories where it was

* The address was published in the JOURNAL of Sept. 28, p. 475.—ED. J.G.L.

first introduced, and that this name has stuck to it when adopted in gas-works. But its correct title, when employed in gas-making, should be, not "Exhausters," but "Propellers."

The usefulness of the so-called exhausters in gas-making is simply to enable the gas to pass forward at the same rate as it is evolved or produced in the retorts; and the necessity for such an apparatus is owing to the mass of material through which the gas must make its way in the process of purification, &c. But for the obstacles thus created to its free progress, there would be no need for the "exhausters" at all. The gas, when generated—owing to its normal lightness, compared with the air, further increased by the rarefaction produced by its high temperature in the retorts—will make its exit from the retorts as rapidly as can be desired, provided there be no obstacles to its subsequent progress. It is to overcome these obstacles, or the so-called "back-pressure" which they occasion, that a propelling power is needed, and for that purpose only.

But the term "back-pressure," likewise, is a misnomer. There is no *back*-pressure at all—the pressure is constantly forwards. What is really meant by "back-pressure" is simply the amount of *forward* pressure which the gas has to acquire, by accumulation, before it can make its way through the obstacles which it meets upon leaving the retorts. Just as a stream of water, when it meets with an impediment, has its course checked until the waters accumulate in sufficient quantity to force a passage onwards; so the gas, on leaving the retorts, has to pass through a series of washers or scrubbers and purifiers, and in consequence, if not artificially helped, it could not escape from the retorts (as naturally it would do) as quickly as it is produced. The fact that gas managers carefully watch the gauge connected with the "exhausters," in order that they may never be worked to such an extent as to produce even the slightest degree of "vacuum" in the retorts, shows of itself that the said apparatus is entirely misnamed, and is employed, not for exhausting the retorts, but simply to propel the gas through the purifying material and other obstacles as fast as it is generated from the coal.

Although Shakespeare makes the love-sick Juliet ask "What's in a name?" every one knows there is a great deal in a name; as, indeed, Juliet herself found to her cost. In the present case, the name, or rather the misnomer, has probably had a good deal to do in occasioning the mistake. The Scotch are pre-eminently a logical people; and the President of the West of Scotland Association of Gas Managers might naturally argue thus: "Since exhausters are useful and necessary in gas-making, why do we not employ them as such?" Anyhow, I think, and it has long ago occurred to me, that it would be well to replace the misnomer of "exhausters" by a more correct name like "propellers."

In regard to the president's daring, though quasi-logical, proposal to employ the "exhausters" to their full extent—*i.e.*, so as to produce "a perfect vacuum in the retorts," and also to do this with a view to "increased revenues," I think there are very few men who will entertain the suggestion; and I am quite sure that, upon trial, they would quickly abandon it. Apart from any effect which the maintenance of a "perfect vacuum" would have in weakening the retort, it is obvious that, under such a mode of working, only perfectly sound or unleaking retorts could be used, which would occasion a far more frequent and costly replacement of the retorts than at present; or else that the flame or vapour in the flues would be drawn into the retort, whereby the gas would be fouled to an enormous extent with sulphur, while, at the same time, the carbonic acid, likewise drawn in, would most seriously impair or destroy the illuminating power, which is the saleable element of gas.

One word more, as to the deposit of carbon in the retorts. It is a mistake to regard this deposit as representing a corresponding loss of quantity or illuminating power in the saleable or "permanent" gas. Undoubtedly, the less deposit in the retorts the better; but I venture to think, upon very obvious grounds, that 99-100ths, if not 999-1000ths, of the carbon so deposited is not taken from the "permanent" gas at all, but merely from those tarry vapours which would have to be got rid of by condensation.

21, *John Street, Adelphi, Oct.* 15, 1875. R. H. PATTERSON.

A SIMPLE INQUIRY.

SIR,—I should be much obliged if any of your readers would kindly inform me the simplest and best means for depriving gas of its ammonia, as also the means for rendering that residue profitable.

A YOUNG GAS MANAGER.

Legal Intelligence.

LONG ASHTON PETTY SESSIONS.—FRIDAY, OCT. 8.

(*Before Sir* A. ELTON, *and a Bench of Magistrates.*)

CONVICTION OF A WATER COMPANY FOR BREAKING UP A HIGHWAY WITHOUT NOTICE.

The Bristol Water-Works Company appeared to answer two summonses for having, on Aug. 9, unlawfully opened or broken up a certain street in the parish of Long Ashton, being the highway from Flax Bourton through Long Ashton to Bristol, under the control or management of the Highway Board, without giving the board such notice as was required by sect. 40 of the Water-Works Clauses Act, 1847.

Mr. GOODEVE appeared for the Highway Board, and Mr. NORRIS for the Water-Works Company.

An application to postpone the hearing on the ground of want of time to prepare for the defence, and also for informality in the summonses, having been argued and refused,

Mr. NORRIS contended that the magistrates had no jurisdiction under the Act of the company, even assuming that it incorporated sect. 30 of the Companies Clauses Act. The only power the bench had to deal with the company was under the provisions of the Highway Act. Under the local Act there was no jurisdiction at all, though very likely it was intended there should be.

The BENCH ruled that they could not entertain Mr. Norris's objection; but they agreed to grant him a case for a superior court in case of a conviction.

Mr. GOODEVE then opened the case, remarking that the only notice which the board received with reference to these works was from the contractor, who, in September, wrote that he wished to continue opening the roads, and would be glad to arrange with the board surveyor to examine the work. That, however, could not cure the neglect to give plans and notice at the commencement of the work.

Mr. *James Hawkins*, surveyor to the board, explained that the works in question were commenced on Aug. 9, at the boundary of the parishes of Long Ashton and Flax Bourton; and witness had not at any time received any plan or written notice of intention to do the work, but saw a notice handed in at a meeting of the board, signed by Mr. Mereweather, contractor of the company.

Cross-examined by Mr. NORRIS: He believed he met Mr. Mereweather on Aug. 14, and had a conversation with him as to what he was going to do with the stones at the tunnel. Witness thought the contractor was doing wrong, and wished him to desist from selling the stones. He did not think Mr. Mereweather refused to give up the stones, but believed the contractor said it was a matter of indifference to him, and rested with the water company. There was work being conducted by the board in a narrow part of the road at the same time, and the traffic was obstructed. He had heard a letter read at the board from the company, with reference to a suggestion that the company should pay a man to superintend the pipe-laying involved by this work, and on the previous Monday the company wrote, declining to pay the guinea a week.

Re-examined: A superintending mason had been engaged and paid by the board for this work, which was previously done in a very unsatisfactory manner.

William Reece, clerk to Mr. O'Donoghue, clerk to the Highway Board, proved seeing these works at the time of their commencement on Aug. 9. Did not remember Mr. Mereweather calling at the office on Aug. 6, and witness referring him to Mr. Gill, a fellow-clerk.

William Curtis, the inspector of works referred to, proved seeing the opening of the ground on Aug. 9.

In cross-examination by Mr. NORRIS, witness swore the ground was much broken on that day, and not merely marked.

Mr. *Mereweather*, contractor for the company, stated that he began the works in question on Aug. 9 for laying a 20-inch water-main. Before commencing the work he gave the board no written notice, and was not aware that any such notice was given.

By Mr. NORRIS: Called at Mr. O'Donoghue's office on Aug. 6, and saw Mr. Reece, who told him he would meet the assistant highway clerk, Mr. Gill, on the road. Witness met Mr. Gill, told him he was going to commence putting in the water-pipes, and asked whether any notice was required. Mr. Gill replied that he did not think any notice would be required, and witness asked him to drop a line if notice was required, adding that if he did not hear from him he would begin the work on Monday morning. Shortly after Aug. 9 witness met Mr. Hawkins, who asked what witness was going to do with the stones from the tunnel, adding that witness must not sell or remove them, because they were the property of the Highway Board. Witness, not knowing what quantity he would require for repairing the trench, declined to give up possession, and said he should keep them until the board proved their title. At the request of Mr. Alexander, secretary to the company, witness, on Sept. 6, signed a notice to the board, and soon afterwards gave it to one of the board clerks. Had no recollection of seeing the board surveyor on the works before the previous week. From long experience, witness believed he had filled in the trench in the best possible way.

This being the case on the part of the Highway Board,

Mr. NORRIS, addressing the bench, said that, so far from this being in any respect a *bonâ fide* prosecution, and so far from the board not wishing to throw difficulties in the way of the company in the execution of the work, the proceedings were calculated very seriously to harass and impede them in the discharge of a statutory power under which they were acting. If the company had been prepared to pay a guinea a week to a supervisor, they would never have heard of these harsh proceedings. He admitted that the company ought to have given three days written notice of their intention to take up the road, and, not having done it, they were technically guilty of an offence within the meaning of the Act, though, to all intents and purposes, the board had every notice necessary, if not in the form prescribed. The company had done the utmost they could to meet the requirements of the board, and no substantial damage, though some inconvenience, had been occasioned. He, therefore, urged that the penalty, against the imposition of which he could not struggle, should be a nominal one.

The bench having convicted in a penalty of £5 and costs, subject to the case granted,

Mr. GOODEVE withdrew the second summons.

Mr. NORRIS said the company were perfectly willing to conduct the work in any way the board required, if they would state what they wished; but they did not deem themselves called upon to pay the sum they were asked for by the board for a supervisor.

SALE SESSIONS.—TUESDAY, OCT. 12.

UNAUTHORIZED LAYING OF SERVICE-PIPES.

The Stretford Gas Company were summoned by Thomas Lamb, a plumber and gasfitter of Sale, for refusing to supply gas to a house which he had built at Sale.

Mr. EDGAR, of Manchester, appeared for the complainant; and Mr. BEST for the defendants.

The *complainant*, an authorized gas-fitter, built a house, and laid the service-pipes from the meter to defendants main in the road. The complainant applied to the defendants to attach the pipes to the main, but they refused to do so, and volunteered to lay down other service-pipes, and then they would attach the pipes. This the complainant declined to agree to. The question at issue was—had the complainant, as an authorized gas-fitter, a right to lay down service-pipes to the main of the defendants?

On behalf of the defendants it was contended that he had not, as the gas company were responsible for their safety.

The BENCH held that, under the circumstances, the defendants had done right in refusing to supply the gas, as they were the proper parties to lay down the service-pipes.

The case was dismissed.

YORK COUNTY COURT.—THURSDAY, OCT. 5.

ALLEGED ILLEGAL DISTRAINT BY A GAS COMPANY.

ROE *v.* THE YORK UNITED GAS COMPANY.

Mr. V. BLACKBURN appeared for the plaintiff, and Mr. SMITH for the defendants.

This was an action brought by the plaintiff, an auctioneer and furniture dealer, for an alleged illegal distraint, and the damages were laid at £5 5s. It appeared from the statement of counsel that the cause of action arose at the house, No. 5, St. George's Terrace, occupied by Alice Rogers, the goods seized being the property of the plaintiff under an agreement. It was contended that the gas company had no power to make such distraint, as there was no relationship between Alice Rogers and the gas company as between landlord and tenant. Alice Rogers was not the tenant of Mr. Roe, from whom she had simply hired the furniture in the house. There was a meter on the premises, and an application was made by Mr. James Leadley, appraiser, on behalf of the company, for payment of the rent of it. It was pointed out that the company had first authorized their agent to distrain for 7s., being the rent of the meter, and subsequently for the consumption of gas. Leadley levied on a feather bed, bolster, and pillows at a sale which was held on the premises on Tuesday, the 29th of June, producing his warrant to Mr. Roe, who was the auctioneer; and he gave notice to the tenant of his having removed the goods, which would be sold within five days if they were not replevined and the costs, &c., paid. The value of the chattels taken away from the house in St. George's Terrace was said to be about £3 10s. The plaintiff previous to the sale had interviews with the gas collector, Mr. Cowper; Mr. Sellers, the company's

secretary; and Alderman Weatherley, and to Mr. Sellers he declined to pay 4s. 6d., Mr. Sellers remarking that it was the custom for the agent to receive 2s. 6d. in similar cases, and Mr. Roe himself had been similarly employed, Mr. Blackburn called attention to the 174th and 177 th clauses of the Act, which defined the gas company's powers and their remedies in the event of consumers failing to satisfy their claims; the former enacting that directors lending any meter for the consumption of gas supplied for such remuneration as might be agreed upon between the company and any person to whom the same might be lent, and which might be recoverable as rents or charges due to the company, such meter should not be subject to distress nor be seized for rent. The 177th clause enacted that if any person supplied with gas by such company should neglect to pay any rent due to them, they should be at liberty to stop the gas by cutting off the service-pipe, and recover the rent due, if less than £20, together with expenses, by the same means as landlords were by law empowered to recover rent in arrear.

His HONOUR asked Mr. Blackburn if he contended that if Alice Rogers had any goods in the house she would not be liable to her landlord.

Mr. BLACKBURN admitted, for the sake of argument, that she would; but the company were not the landlords, and had no right to seize goods that belonged to Mr. Roe, who had only lent them.

His HONOUR: Supposing Alice Rogers had happened to be in arrear to the landlord, could not the landlord have put in a distress?

Mr. BLACKBURN: The landlord could not distrain on Mr. Roe's goods; and the company cannot distrain upon these goods for the purpose of paying the rent of the meter.

His HONOUR: I am not speaking about the company at present; what I want to know is, suppose Alice Rogers was liable for rent to her landlord, could not the landlord have seized the goods of Mr. Roe on the premises?

Mr. BLACKBURN said that was not the point he was putting. What he was arguing was that the landlord could not have distrained under the circumstances.

His HONOUR: I am talking about rent in arrear.

Mr. BLACKBURN; Clearly he might; I am not going to put such a foolish argument. What I say is the gas company are not in the position of such a landlord; the distraint must be on the goods belonging to the person consuming the gas. To begin with, the company did not lend the meter to Alice Rogers, it was on the premises; and the commencement of these proceedings was for the consumption of gas and not for the hire of the meter. Mr. Roe does not come under the description of the section, and the person to recover from in any form of action was Alice Rogers.

Mr. SMITH: We do not know Mr. Roe in the matter.

Mr. BLACKBURN: The meter is the property of the landlord of the premises.

Mr. SMITH: It belongs to the gas company, and Alice Rogers paid 1s. a quarter for it.

Mr. BLACKBURN: But then it is not distrainable by the landlord.

Mr. SMITH: It is her goods we distrain.

Mr. BLACKBURN: They were not hers either.

Mr. SMITH: They were found in her house.

Mr. BLACKBURN: It is not her house.

Mr. SMITH said if the gas company could not recover they would really be at the mercy of everybody.

Mr. BLACKBURN: Don't say that, for really everybody has been at the mercy of the gas company. There is an Act giving them special privileges, and they should show that they have fulfilled those privileges. The company through their agent have actually seized upon goods which were never brought into the premises during the whole time of the gas being consumed. The company, through their agent, were told by Mr. Roe that the goods were his, and had therefore taken away their own case. They are not in the same position as a landlord.

The *Plaintiff* deposed to the fact of the hiring of the furniture and to the sale in St. George's Terrace. When Mr. Leadley produced his warrant for distraining, he told him that the goods were his (plaintiff's). Leadley went upstairs, followed by witness, and took possession of a bed, sheets, pillows, and pillow-cases. He estimated the value of the bed alone at £3 10s.

Other witnesses having been called,

His HONOUR referred to a case of the Birmingham and Staffordshire Gas Company, where that company had been held empowered to recover as landlords, and he took it that the two companies stood exactly in the same position in regard to the question of landlords, and the only question was as to whether the company were entitled to seize property belonging to another person. In point of form the documents relating to the charge for gas and for rent of meter referred to by Mr. Blackburn were slightly wrong, but there was no substantial defect. He considered the company were perfectly justified in making the present seizure, and found for the defendants, with costs.

Mr. BLACKBURN asked for a case, but withdrew the application on his honour intimating that he was not disposed to grant one.

ROE *v.* LEADLEY.

This action, which was for an alleged excessive distraint, arose out of the preceding, and the same counsel were engaged, and it was brought to recover from Mr. Leadley, appraiser, the difference between the value of the goods seized and the amount of the gas company's claim.

Mr. BLACKBURN stated that the value of the goods seized was £3 10s., and he called witnesses to prove that the bed alone had been bought a few days previously for 28s. at a sale by auction, but that the broker who bought it valued it at £2 10s., and another broker had offered £2 2s. for it.

For the defence, *Leadley* was called, and swore that the goods seized were appraised by a licensed appraiser at £1 15s.; the costs of the distress were £1 11s. 0½d., leaving a deficit on the transaction as far as the gas company was concerned.

In cross-examination by Mr. BLACKBURN, defendant denied having told Mr. Roe that he (Leadley) did not care if Roe got £2000 from the company, so long as defendant was kept from harm.

His HONOUR, after striking out 2s. 6d. from the bill, gave a verdict for the defendant, and considered that the charges were not at all excessive.

HUDDERSFIELD COUNTY COURT.—FRIDAY, OCT. 1.
(*Before Mr.* GIFFARD, *Judge.*)

DISPUTED GAS ACCOUNT.

Mr. *T. Bates*, woolstapler, was summoned for non-payment of £7 18s., due to the Corporation of Huddersfield, being their claim against him for 23,000 feet of gas, alleged to have been burnt at his house in the first half year of 1874, and 15,000 consumed during the second half of the same year.

Mr. J. BURGESS, manager of the gas-works, appeared to support the claim.

The defendant read a list, showing the amount of gas consumed by five burners in his house since the first half year of 1870; and it seemed from this that it had increased from 7000 during that half year to 23,500 feet, with two lights less in the first half year of 1874. The defendant had several times complained about the increase in the consumption, and owing to this the meter (a wet one) was replaced at the latter part of 1874 with a dry one, but the increase had gone on; and, as he refused to pay for the whole amount, the present action was brought.

After hearing evidence in support of the above facts, the JUDGE said that the Act of Parliament simply required that there should be *primâ facie* evidence that the meter was incorrect; and, as he thought the sudden rise from 17,400 feet in the latter half of 1873 to 23,500 feet was *primâ facie* evidence of that fact, he gave a verdict for the defendant for the payment of 15,000 feet only.

HUNTINGDON COUNTY COURT.—WEDNESDAY, OCT. 13.
(*Before Mr.* HOMERSHAM COX, *Judge.*)

DISPUTED GAS ACCOUNT.

Mr. *Winfield* was sued by the Huntingdon Gas Company for £6 5s. 5d., for four quarters gas and meter rent.

The defendant paid £2 1s. 2d. into court for the last two quarters, and disputed the remainder, his contention being that the meter did not register correctly, and that when he complained the company's servants took the old meter away and supplied another. He was never told that it had been tested, and the fitter said it had been broken up.

The evidence given by the servants of the company showed that the meter was found to be correct, and was now being used by another person. The reason that another was substituted was that the old one was too small to register the whole quantity of gas consumed, and a larger one was supplied. The account of which defendant complained was smaller than in the corresponding quarter of the previous year. The meter never went away to be repaired.

It having been pointed out that the index of the meter was *primâ facie* proof of the quantity of gas burnt, and any dispute must be decided by two justices, the learned judge gave judgment for the plaintiffs, without costs.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

Dr. Letheby, the chief gas examiner under the Board of Trade, has recently submitted to the City authorities, and to the Metropolitan Board of Works, the results of the daily testings of the gas supplied by the Chartered, the Imperial, and the South Metropolitan Gas Companies during the last three months. The testings have been made at nine places by the gas examiners appointed by the City and the Metropolitan Board; and four of those places are supplied by the Chartered Company, four by the Imperial, and one by the South Metropolitan. The illuminating power of the gas when burnt at the rate of 5 cubic feet an hour from a Sugg's London Argand in the case of common gas, and from a bat's-wing burner in the case of cannel gas, has been as follows:—

Illuminating Power in Standard Sperm Candles.

	Kind of Gas and Testing-Place.	Max.	Min.	Aver.
Char-tered Gas.	Common gas, Beckton	19·7	16·6	17·88
	,, Friendly Place	17·4	16·0	16·45
	,, Ladbroke Grove	18·0	16·3	16·88
	Cannel gas, Millbank	23·5	20·1	21·41
Imperl. Gas.	Common gas, Carlyle Square	17·6	15·0	16·92
	,, Camden Street	17·3	14·6	16·19
	,, Graham Road	18·7	14·9	16·87
	,, Bruce Terrace	17·2	15·2	16·11
	South Metropolitan Company, Hill Street	17·5	15·2	16·12

These results show that the illuminating power of the gas at each of the testing-places has been constantly above the requirements of the Acts of Parliament.

As regards impurity, Dr. Letheby reports that the gas of the Chartered Company at Beckton was on eight occasions slightly charged with sulphuretted hydrogen, but that at all the other testing-places it was quite free from this impurity. The maximum, minimum, and average amounts of sulphur in the gas of the several companies were as follows:—

Grains of Sulphur per 100 Cubic Feet of Gas.

	Kind of Gas and Testing-Place.	Max.	Min.	Aver.
Char-tered Gas.	Common gas, Beckton	15·4	7·7	11·32
	,, Friendly Place	13·4	5·5	8·92
	,, Ladbroke Grove	19·1	7·4	11·77
	Cannel gas, Millbank	13·0	5·2	9·24
Imprl. Gas.	Common gas, Carlyle Square	18·7	14·0	16·13
	,, Camden Street	15·3	8·7	11·73
	,, Graham Road	12·7	5·2	7·61
	,, Bruce Terrace	16·5	6·4	10·48
	South Metropolitan Company, Hill Street	22·9	8·7	13·61

The proportion of sulphur in the gas at Beckton exceeded the prescribed amount of 15 grains per 100 cubic feet on one occasion, and at Bruce Terrace on two occasions. Twice, also, the gas of the South Metropolitan Company contained an excess of this impurity (over 20 grains per 100 feet). Dr. Letheby reports, however, that as regards the presence of sulphuretted hydrogen in the gas at Beckton, and the excess of sulphur, as well as that in the gas at Bruce Terrace, he has ascertained that on all occasions it was due to accidental causes. The proportion of ammonia in the gas of the several companies has never reached the prescribed quantity of 2·5 grains per 100 cubic feet—the average being from 0·02 grains to 1·47 per 100 feet. Dr. Letheby concludes his report to the Metropolitan Board of Works by remarking that there were 110 defaults in the returns of the daily testings during the quarter—89 of which were from imperfect experiments by the officers of the board, and 21 from failures in the delivery of the reports. He states also that 44 of these are referable to the testing-place at Hill Street, Peckham, and 21 to Carlyle Square.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone during August and September:—

AUGUST.

1875.	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon. in 100 Cu. Ft.	Sulphuretted Hydrogn.
	*Mean of 23 Obser.	Highest.	Lowest.	Highest.	Lowest.	Grains.	Grains.	
Imperial Comp.'s gas	16·45	16·91	15·60	24·77	9·63	27·90	0·70	No trace
Chartered Comp.'s common gas	16·31	16·81	15·53	29·78	13·60	14·17	0·90	No trace
Chartered Comp.'s cannel gas	20·88	22·80	19·71	21·14	10·60	20·19	0·56	No trace

Mean of daily readings of barometer . . . 29·92
,, ,, ,, thermometer . . . 74·58

SEPTEMBER.

	*Mean 13 Obs.							
Imperial Comp.'s gas	16·26	17·21	15·72	23·64	9·12	11·90	0·65	No trace
Chartered Company's common gas	16·14	17·11	15·71	28·78	12·44	10·64	0·70	No trace
Chartered Company's cannel gas	20·36	20·80	20·01	21·20	10·64	17·61	0·45	No trace

Mean of daily readings of barometer . . . 29·80
,, ,, ,, thermometer . . . 68·00

* Each observation consists of ten readings of the photometer, at intervals of one minute.

During the months of August and September, the mean illuminating power of all the gases consumed in the parish was satisfactory. In August the Imperial

Company's gas gave a mean light equal to about 16½ candles, the range being from 15·60 to 16·91 candles. In September the mean was 16·26 candles, the range being from 15·72 to 17·21 candles. The mean amount of sulphur in August in 100 cubic feet of gas was 28 grains, and of ammonia 0·70 of a grain. In September the sulphur was only 12 grains, and the ammonia a little over half a grain. The Chartered common gas in August gave a mean illuminating power equal to 16·31 candles, the range being from 15·53 to 16·81 candles; and in September the mean was equal to 16·14 candles, the range being from 15·71 to 17·11 candles. In August the sulphur in this gas amounted to 14 grains, and the ammonia to nine-tenths of a grain. In September the sulphur amounted to 10½ grains, and the ammonia to seven-tenths of a grain. The mean light of the cannel gas in August was equal to 20·88 candles, and in September to 20·36 candles, the range in both months being from 19·71 to 22·80 candles. In August the sulphur found was 20 grains, and the ammonia half a grain; and in September the former amounted to 17½ grains, and the latter to less than half a grain. Throughout both months the pressure was generally good, and on no occasion was sulphuretted hydrogen detected in either of the three gases by the ordinary tests. The above results were obtained from the gas manufactured by the Imperial Company at their Fulham works, and from the Chartered Company's gas manufactured at their works, Beckton and Bow.

METROPOLITAN BOARD OF WORKS.—At the meeting of the Board on Friday last, Mr. Legg submitted a motion for a return of the costs incurred during the last session in promoting or opposing bills, stating the amount expended on each bill, and distinguishing the cases in which the action of the board was successful or otherwise. Mr. Elt seconded the motion, which was vigorously opposed by Mr. Newton and Mr. Roche, the latter thinking it was only an attempt to gain information for the gas companies. Mr. Leslie supported the motion, and contended that the board had no right to expend the ratepayers money upon the promotion of the three abortive gas bills of last session. The chairman having stated that a return to an order of the House of Commons, as to the money spent by the board in parliamentary proceedings during the past five years, had occupied the attention of their officers for a long time, the motion was put, and negatived by a majority of six.

LONDON AND SUBURBAN GAS COMPANIES.

A Few Items from the Accounts for the Half Year to June, 1875, compiled by Mr. G. Livesey.

Name of Company.	Tons of Coals used.	Price of Coals.	Receipts per Ton of Coal. For Coke.	Receipts per Ton of Coal. For Total Products.	Net Price of Coals.	Receipts per £100 paid for Coals. On Coke.	Receipts per £100 paid for Coals. On Total Products.	Profits. Deficiency.	Profits. Surplus.	Price of Gas.
Northern companies—		s. d.	s. d.	s. d.	s. d.	£ s. d.	£ s. d.	£	£	
The Gaslight	244,354	21 10	5 2	8 11	12 11	23 17 3	40 16 10	42,550*	..	* Partly estimated. 3s. 9d. and meter-rent.
Imperial	217,154	19 10	4 11	8 2	11 8	24 14 6	41 1 5	28,196	..	3s. 9d. ditto.
Commercial	48,380	19 4	6 3	9 1	10 3	32 9 11	46 18 7	420	..	3s. 9d. No meter-rent.
Independent	Not known.	..	..	..	..	36 14 11	57 3 5	..	5,980	3s. 6d. and meter-rent.
Ratcliff	10,626	16 10	7 1	11 7	5 3	42 0 0	69 0 9	..	3,108	3s. 9d. ditto.
Southern companies—										
Phœnix	69,866	20 9	7 1	8 10	11 11	33 19 6	42 12 3	..	4,748	4s. 2d. ditto.
London	58,058	19 6	7 0	10 7	8 11	35 15 10	54 3 8	..	3,008	4s. 6d., 4s., 3s. 9d.; average.
South Metropolitan	44,205	17 8	7 2	11 3	6 5	40 14 4	63 15 9	partly estimated	373	4s. 3·6d. and meter-rent.
Surrey Consumers	20,818	18 7	7 7	10 2	8 5	40 18 10	54 13 4	..	2,867	3s. No meter-rent.
Crystal Palace, a suburban company.	16,632	22 11	7 5	10 4	12 7	32 11 7	45 5 11	..	115	4s. 6d. to March. [rent. 4s. 2d. to June, and meter- 4s. 2d. and meter-rent.

Note.—The Gaslight Company used 7½ per cent. of cannel; their standard is 16 candles, and they supply a portion of cannel gas. The Crystal Palace Company is not a metropolitan company. They have to pay nearly 3s. a ton for railway carriage of their coals. The South Metropolitan do not buy coals from hand to mouth, but have made short contracts during the past three years; the odd cargoes bought in that time amounting only to 15,000 tons, while 230,000 tons have been contracted for.

Note also the singular uniformity in the amount received for coke per ton of coal in the case of all the southern companies and the Ratcliff, which last, however, surpasses all the rest in several important particulars.

METROPOLIS WATER SUPPLY.

The Registrar-General publishes the following returns of the average daily quantity of water supplied by the London water companies during the month of September, 1875. According to their returns, 126,241,078 gallons, or 573,571 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 242·7 gallons (110·3 decalitres), rather more than a *ton* by weight, to each house, and 34·2 gallons (15·5 decalitres) to each person, against 33·2 gallons during September, 1874. According to returns of the London water companies made to the select committee on East London Water Bills (session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total supply of water for all purposes was for domestic use. Applying this proportion to the total quantity supplied daily in the month of September, 1875, it may be estimated that about 103,517,684 gallons were used for domestic purposes, or about 28·0 gallons per day for each inhabitant, against 27·2 in the corresponding month of last year. This proportion varies from month to month, but the Registrar-General has no means of giving a more reliable estimate.

Companies.	Number of Houses, &c., supplied in Sept., 1874.	Number of Houses, &c., supplied in Sept., 1875.	Aver. Daily Supply of Water in Gallons* during Sept., 1874.	Aver. Daily Supply of Water in Gallons* during Sept., 1875.
Total supply	512,825	520,099	120,870,965	126,241,078
From Thames	240,964	244,523	61,816,750	63,704,524
„ Lea and other Sources	271,861	275,576	59,054,215	62,536,554
THAMES.				
Chelsea	28,467	28,555	8,065,700	7,920,500
West Middlesex	46,243	47,209	9,907,503	10,403,570
Southwark and Vauxhall	79,786	80,230	18,973,822	19,275,500
Grand Junction	35,144	35,709	11,293,245	11,838,854
Lambeth	51,324	52,820	13,576,480	14,266,100
LEA AND OTHER SOURCES.				
New River	122,464	123,628	29,078,000	30,633,000
East London	106,459	107,851	23,357,000	25,040,000
Kent	42,938	44,097	6,619,215	6,863,554

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for September, 1875, as compared with that for the corresponding month of 1874, shows an increase of 7274 houses, and of 5,370,113 gallons of water supplied daily.

Dr. Whitmore's report on the composition of Thames companies and other waters supplied in Marylebone during August and September:—

1875.	Total Solid Matter in degrees or grains per Imperial gallon. Aug., 1874.	Total Solid Matter in degrees or grains per Imperial gallon. Aug., 1875.	* Loss by incineration of Solid Matter in previous column. Aug., 1874.	* Loss by incineration of Solid Matter in previous column. Aug., 1875.	Hardness before boiling, in degrees.	Hardness after boiling, in degrees.
Distilled Water	0°	0°	0°	0°	0°	0°
West Middlesex water	16·32	19·44	0·64	0·88	12·98	2·98
Grand Junction water	16·60	20·40	0·68	0·96	13·04	3·02
	Sept., 1874.	Sept., 1875.	Sept., 1874.	Sept., 1875.		
Distilled Water	0°	0°	0°	0°	0°	0°
West Middlesex water	16·59	19·20	0·72	0·80	12·80	2·94
Grand Junction water	17·48	20·00	0·80	0·88	13·14	3·00

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water.

During the months of August and September, the water supplied to the parish has been generally clear, bright, and well filtered. As compared with the quality of the water supplied in the corresponding months of last year, there was some excess in the amount of solid matter which it contained. Complaints have been made of the quality of the water supplied to some few houses in the parish, but, on investigation, it has been found that the water receptacles required cleaning out. Unless this is periodically done—say, at intervals of six months—and the receptacles at the same time properly covered to keep out dust and other noxious particles floating in the air, the inevitable result will be that the water in them will become foul.

Dr. Frankland, F.R.S., reports, as the result of a chemical examination of the waters supplied to the metropolis during the month of September, that the proportion of "organic impurity in all the river waters was much less than that observed in August," and that the water supplied by the New River Company was in this respect nearly as pure as the Kent Company's water derived from deep wells in the chalk. All traces of "previous sewage contamination" in the East London Company's water had been obliterated by long storeage in reservoirs. The Lambeth Company's water, however, when drawn at the cab rank in the Westminster Bridge Road, on the 15th of September, was "slightly turbid and contained moving organisms visible to the naked eye." The remainder of the samples, when drawn for analysis, had been efficiently filtered. Taking unity to represent the amount of organic impurity in a given volume of the Kent Company's water, the proportional amount in an equal volume of the water supplied by each of the other metropolitan companies was: New River 1·2, West Middlesex 2·8, Southwark 2·9, East London 2·9, Grand Junction 3·1, Lambeth 3·1, and Chelsea 3·6.

Major Bolton reports that throughout the month of September the state of the water in the river Thames at Hampton, Molesey, and Sunbury, where the intakes of the West Middlesex, Grand Junction, Southwark and Vauxhall, Lambeth, and East London Companies are situated, was good. The highest flood state of the river at Hampton during the month was 5 inches above the (6 feet) summer level, and the lowest was 1 inch below summer level. At Seething Wells, Kingston, the state of the water was good in the river during the month. The highest state of the flood water at this place was 5 inches above, and the lowest was 1 inch below summer level. The highest temperature of the water during the month was 64°, and the lowest 57°, while the highest temperature of the air at the same place was 75°, and the lowest 55°. These observations were made daily at nine a.m. The rainfall during the month was 1·44 inches. A slight interruption in the supply to a small portion of the Southwark and Vauxhall Company's district took place between the 19th and 21st of September, in consequence of a burst on the 36-inch main near the Wandle Bridge, at Wandsworth; the engines supplying water from the Hampton to the Battersea works were stopped from nine p.m. on Sunday, the 19th, until noon on Tuesday, the 21st of September, and, consequently, it was found necessary to reduce the pressure to a portion of the district during that time. All the companies effectually filtered the water supplied by them to the metropolis during the month of September, and it was delivered into their mains clear and bright.

EPWORTH PUBLIC LIGHTING.—At a vestry meeting, held on Wednesday last, the inspector of the lighting district produced the accounts for the past year, which showed a balance in hand of £4 8s. It was resolved that the tender of the gas company, to light (and extinguish at eleven o'clock) the 51 lamps in the town during six months for £79 16s., be accepted, and that the amount to be raised to meet this and other expenses incidental thereto be £88.

COLCHESTER GAS SUPPLY.—At the meeting of the Colchester Town Council on the 6th inst., the town-clerk, in reply to an inquiry, said the estimated expense to the borough of opposing the gas company's bill in the last session of Parliament was £900. Some complaints having been made, that notwithstanding an increase in the price of gas, the quality was inferior, it was referred to the Sanitary Committee to consider and report, as to the desirability of appointing a gas inspector. Owing to a mistake at the works on the evening of the 30th ult., the town was left in total darkness for some time.

LONDON GASLIGHT COMPANY.

The Ordinary Half-Yearly Meeting of Proprietors was held at the Freemasons Tavern, Great Queen Street, Lincoln's Inn Fields, on Wednesday, Oct. 13—MAJOR ROHDE HAWKINS, Esq., the governor, presiding.

The SECRETARY (Mr. A. J. Dove) read the notice convening the meeting, the seal was affixed to the register of proprietors, and the following report and statements of account were presented, and taken as read:—

Annexed to this report your directors submit the half-yearly accounts, which show the result of the manufacture and distribution of gas up to June 30, 1875.

It will be seen from the accounts that the operations of the half year compare favourably with the corresponding period of last year. The cost of coal has been reduced by £20,689 17s. 10d., and the rental for gas increased by £6637 17s. 9d. After reserving £10,691 8s. 8d., the amount required for dividends on the preference capital, and appropriating £750 to the redemption-fund, in accordance with the provisions of the London Gaslight Act, 1857, the sum of £22,655 7s. 10d. remains applicable to dividend on the ordinary capital. The directors are thus enabled, without drawing on the reserve, to recommend that the usual dividends be declared—viz., on all classes of preference stocks and shares at their respective rates, and at the rate of £10 per cent. per annum on the ordinary stock.

A large amount of debentures issued by the company being overdue, and the holders still desiring to continue the investment, the directors think it advisable that they should be empowered to substitute a permanent debenture stock for these debentures, so that the company should not suffer the inconvenience of being called upon to pay off large sums at a time when a high rate of interest might rule in the market. A permanent saving will thus be gradually effected in the charge for interest by the issue of such stock.

With this object, and for the further purpose of conferring on the directors power to issue future loans as debenture stock, the extraordinary meeting to be held at the close of the present meeting has been called.

In their last report to the proprietors the directors expressed the opinion, with reference to the remaining bill at that time being promoted in Parliament by the Corporation of London and the Metropolitan Board of Works, that the Government would not pass in its then shape a measure so unjust in its provisions, and moreover, opposed to the interests of the public. This opinion was justified by the subsequent withdrawal in committee of some of the most material provisions of the bill, and by the substitution of others less obnoxious. Whatever may be proposed for the future, it will be the care of the directors to watch the interests of the company, and to promote the objects of the undertaking in a way calculated to meet the public requirements.

No. 1.—STATEMENT OF STOCK AND SHARE CAPITAL, *on June* 30, 1875.

Acts of Parliament relating to the Raising of Capital.	Description of Capital.	Maximum Dividend authorized.	Number of Shares issued.	Nominal Amount of Shares.	Called up per Share.	Total paid up.	Arrears of Calls.	Remaining to be called up and unissued.	Total Amount authorized.
15 Vict., cap. 82	Ordinary stock	10 per cent.	Stock	Stock	Stock	£383,300	..	..	£383,300
	2nd pref. „	6 ditto.*	Do.	Do.	Do.	11,100	..	..	11,100
	3rd ditto „	6 ditto.*	Do.	Do.	Do.	2,750	..	..	2,750
	1st ditto „	6 ditto.	Do.	Do.	Do.	150,000	..	..	150,000
29 Vict., cap. 55	A ditto shares	6 ditto.	7,622	£25 0 0	£20 0 0	176,205	£230	£14,095 0 0 / 109,450 0 0	300,000
20 & 21 Vict., cap. 73	Debenture stks.	5 & 6 ditto.	Stock	Stock	Stock	26,750	..	..	26,750

* With option of conversion.

No. 2.—STATEMENT OF LOAN CAPITAL, *on June* 30, 1875.

Acts of Parliament authorizing the Loan Capital.	Description of Loan.	Rates per Cent. of Interest.		Total Amount borrowed.	Remaining to be borrowed.	Total Amount authorized.
		4½ per cent.	5 per cent.			
15 Vict., cap. 82	Bond, &c.	£67,460	£74,032	£91,667	..	£91,667
29 Vict., cap. 55	Ditto			49,825	£38,632	100,000

No. 3—CAPITAL ACCOUNT.

Dr.

To Expenditure, to Dec. 31, 1874		£829,538 18 0
Ditto, during half year to June 30, 1875—viz.:		
New buildings and machinery in extension of works	£106 5 7	
New and additional mains and services	422 9 3	
	£528 14 10	
Less excess in meters returned to store	264 1 5	264 13 5
		£829,803 11 5
Balance		10,700 15 0
Total expenditure		£840,504 6 5
Balance		51,093 8 7
		£891,597 15 0

Cr.

Description of Capital.	Certified Receipts to Dec. 31, 1874.	Received since that date.	Total Receipts to June 30, 1875.
By Ordinary stock	£381,800 0 0	*1,500 0 0	£383,300 0 0
2nd Preference ditto.	11,800 0 0	†	11,100 0 0
3rd ditto ditto.	3,550 0 0	‡	2,750 0 0
1st ditto ditto.	150,000 0 0	..	150,000 0 0
A ditto shares, £25 each, including amount received in anticipation of calls	158,680 0 0	17,525 0 0	176,205 0 0
Debenture stocks, under 20 & 21 Vict., cap. 73	26,750 15 0	..	26,750 15 0
Bonds and other loans	142,792 0 0	¶	141,492 0 0
Note † £700 converted into ord. stk.			
‡ 800 ditto.			
* £1,500			
¶ £1,300 paid off.	£875,372 15 0	..	£891,597 15 0

No. 4.—REVENUE ACCOUNT.

Dr.

To Manufacture of gas—		
Coals, including dues, carriage, unloading, and trimming (see Statement No. 8)	£56,627 9 8	
Salaries of engineers, superintendents, and other officers at works	1,874 11 0	
Wages (carbonizing)	9,565 14 4	
Purification, including £919 16s. 8d. for labour	2,154 19 4	
Repairs and maintenance of works and plant, materials, and labour, less £173 18s. 7d. received for old materials	20,854 15 10	
		£91,077 10 2
The Gaslight and Coke Company, for cannel gas		6,228 8 4
Distribution of gas—		
Salaries and wages of officers (including rental clerks)	2,197 6 4	
Repairs, maintenance, and renewals of mains and service-pipes, including labour	1,239 0 10	
Repairs and renewals of meters	1,512 13 2	
		4,949 0 4
Public lamps—		
Lighting and repairing		1,543 2 7
Rents, rates, and taxes—		
Rents payable	985 15 0	
Rates and taxes	3,621 0 7	
		4,606 15 7
Management—		
Directors allowance	900 0 0	
Company's auditors	75 0 0	
Salaries of secretary, accountant, and clerks	1,073 7 6	
Collectors commission	2,140 8 9	
Stationery and printing	367 9 11	
General charges	538 14 6	
		5,095 0 8
Law charges		31 7 0
Parliamentary charges (oppositions)		786 10 6
Bad debts		550 15 10
Depreciation-fund for works on leasehold land		100 0 0
Superannuations, sick allowances, and gratuities		547 8 9
Repairs of houses		46 4 10
Total expenditure		£115,562 4 7
Balance carried to net revenue account, No. 5		37,867 6 8
		£153,429 11 3

Cr.

By Sale of gas—		
Common gas, per meter, at 3s. 9d., 4s. 6d., and 4s. per 1000 cubic feet	£101,354 12 3	
Cannel gas, per meter, at 5s. per 1000 cubic feet	6,852 11 6	
Public lighting, and under contracts—		
Common gas	9,615 9 2	
Cannel gas	1,483 18 0	
(See Statement No. 10.)		
	119,306 10 11	
Rental of meters	1,965 18 9	
		£121,272 9 8
Residual products—		
Coke, less £1795 18s. 7d. for labour and cartage	20,269 6 5	
Breeze, less £284 5s.	651 12 5	
Tar, less £13 10s.	5,267 13 10	
Ammoniacal liquor, less £26 10s.	4,494 9 5	
		30,683 2 1
Rents receivable		1,467 7 0
Transfer fees		6 12 6
		£153,429 11 3

No. 5.—PROFIT AND LOSS (Net Revenue Account).

Dr.

To Interest on bonds to June 30, 1875	£3,713 18 11	
Dividends on preference capital	10,691 8 8	
		£14,405 7 7
Interest on temporary loans		130 16 4
Redemption fund, reserved per "London Gaslight Act, 1857"		750 0 0
Balance applicable to dividend on ordinary capital		22,653 7 10
		£37,939 11 9

Cr.

By Balance from last account	£31,176 8 11	
Less dividend on ordinary capital for the half year ending Dec. 31, 1874	19,090 0 0	
Amount carried to reserve-fund to Dec. 31, 1874	£12,086 8 11	
Amount from revenue account, No. 4		£37,867 6 8
Interest on moneys on deposit		72 5 1
		£37,939 11 9

No. 6.—RESERVE-FUND.

Dr.		*Cr.*	
To Balance on June 30, 1875	£24,449 7 8	By Balance on Dec. 31, 1874	£12,174 14 4
		Interest on amount invested	188 4 5
		Amount brought from net revenue account for the half year ending Dec. 31, 1874	12,086 8 11
	£24,449 7 8		£24,449 7 8

No. 7.—DEPRECIATION-FUND (for Works on Leasehold Land).

Dr.		*Cr.*	
To Balance on June 30, 1875	£1,300 0 0	By Balance on Dec. 31, 1874	£1,200 0 0
		Amount brought from revenue account for the half year ending June 30, 1875	100 0 0
	£1,300 0 0		£1,300 0 0

No. 8.—STATEMENT OF COALS.

Description of Coal.	In Store, Dec. 31, 1874.	Received during the Half Year.	Carbonized during the Half Year.	Used for Sundries during the Half Year.	In Store, June 30, 1875.
	Tons.	Tons.	Tons.	Tons.	Tons.
Common	5,105	61,484	56,555	26	10,008
Cannel	397	2,399	1,477	..	1,319

No. 9.—STATEMENT OF RESIDUAL PRODUCTS.

Description of Residual.	In Store, Dec. 31, 1874.	Made during the Half Year. (Estimated).	Used during the Half Year. (Estimated).	Sold during the Half Year.	In Store, June 30, 1875.
Coke . . . Chaldrons of 36 bushels	1,615	56,434	14,679	43,156	214
Breeze . . . do. 36 do.	1,656	6,720	147	7,473	756
Tar . . . Gallons	90,000	583,154	..	596,154	77,000
Ammoniacal liquor . . Butts of 108 gallons	3,056	13,463	..	16,075	444

No. 10.—STATEMENT OF GAS MADE, SOLD, &c.

Description of Gas.	Quantity (measured by Station Meters).		Quantity Sold.			Quantity used on Works, &c.	Total Quantity accounted for.	Quantity not accounted for.	Number of Public Lamps.
	Made.	Purchased.	Public Lights and under Contracts (Estimated).	Private Lights (per Meter).	Total Quantity Sold.				
	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	Thousands.	
Common	552,380	..	39,789	471,344	511,133	4,507	515,640	36,740	4,029
Cannel	..	33,217	4,257	27,410	31,667	4	31,671	1,546	836

BALANCE-SHEET.

Dr.		*Cr.*		
To Capital—		By Cash at bankers, and in hand	£22,338 17 1	
For balance, per account No. 3	£51,093 8 7	Cash on deposit at interest	30,000 0 0	
				£52,338 17 1
Net revenue—		Amount invested—		
For balance, per account No. 5	22,653 7 10	Reserve-fund		24,449 7 8
Reserved fund—		Stores in hand—		
For balance, per account No. 6	24,449 7 8	Coals	£11,572 8 5	
Depreciation-fund (for works on leasehold land)—		Coke and breeze	209 1 6	
For balance, per account No. 7	1,300 0 0	Tar and ammoniacal liquor	870 0 10	
Redemption-fund	1,926 13 0	Sundry stores	2,921 11 6	
Interest on bonds and other loans, for amount due to June 30, 1875	2,242 14 4			15,573 2 3
Preference dividends, ditto	10,691 8 8	Accounts due to the company—		
Unclaimed dividends	3,958 18 7	Gas and meter rental, quarter ending June 30, 1875	£37,412 6 9	
Sundry tradesmen and others, for amount due for coals, stores, and sundries	27,902 17 9	Ditto ditto, arrears outstanding	5,396 0 5	
			£42,808 7 2	
		For coke and other residual products	10,563 4 8	
		Sundries	545 17 7	
				53,857 9 5
	£146,218 16 5			£146,218 16 5

The GOVERNOR: Gentlemen, before moving—"That the report and accounts now laid before the meeting be received and adopted," I should like to say a few words. Of course, we have had rather an anxious half year since we last met you; but, before adverting to what has taken place in Parliament, I would desire to congratulate you and ourselves on the prosperous state of this company's affairs. We have been able, as you see from an examination of the accounts, to pay our way very well; we are now able to declare our full maximum dividends, and to carry over about £3500 to the reserve-fund. And we are able to do this after having put our works into a most complete and efficient state; indeed, I do not know of gas-works anywhere which are in a more efficient state, or more capable of meeting any increase of business, than our own. With regard to the legislation, or rather the attempted legislation, of last session, for nothing actually was done, I think it is rather satisfactory, so far as it has gone, for it has shown that no legislation, or, at all events, very little legislation, is really necessary. We are working under what is practically a general agreement, made with Parliament in 1860, and confirmed by a special agreement in our own Act of 1866. That agreement gives us certain duties to perform, under certain conditions then imposed upon us, subject to which we are entitled to such an amount of profit, if we can earn it, as will pay full dividends on our capital. Gas, like water itself, is now almost a necessary of life, and therefore it is quite right that its supply should be placed under a certain amount of regulation; but, inasmuch as it is a necessary of life, surely those people who have invested their money in its manufacture and supply ought to have secured to them a reasonable return on their capital. If, therefore, we are placed under such regulations, and the officials appointed to supervise our working are unable to bring any charge against us of a want of due care and management in the performance of our duties, we are certainly entitled to the benefits conferred by the Act of 1860, and of our own private Act, which, in point of fact, are very much the same as are considered right in all great investments in England, whether gas, water, or railways. I believe that we have satisfactorily discharged our duties; we are now paying our maximum dividends, and are in an efficient condition generally. But for many years we did not pay those dividends; and there are shareholders present, no doubt, who remember the time when we did not pay any dividends at all. Now an attempt is being made to bring in a fresh system of legislation altogether, and one which would render our property extremely insecure. We, therefore, hold it to be our duty to oppose this attempt by all the means in our power. The sliding scale, as it is called, has a very plausible look about it, but I am satisfied it would not answer. It proposes that we may make 11, 12, or even 15 per cent. dividends, if we lower the price of gas in certain proportions to the consumers. I do not think we could do it, and even if we could for one year, we could not be sure that we should be able to continue to do so, and therefore instead of our dividends being tolerably certain, they would be absolutely uncertain. And moreover I consider that we ought not to agree to anything which alters the terms under which we hold our property, and under which we have acted for the last 15 years. I can very well understand the Metropolitan Board of Works attempting this kind of thing; they are a new body, and want to stand well with the public; but I cannot understand why the Corporation of the City of London, which rests entirely upon a respect to vested interests, should join in an attack upon property, which, though not of such great antiquity as their own, rests upon a precisely similar basis. I hope all the proprietors in this company will exert themselves to the utmost to enable us to resist effectually any further attempt, that may be made next year, to force such legislation upon us. With these remarks I move the adoption of the report and accounts.

The Hon. A. KINNAIRD, M.P. (deputy-governor), seconded the motion.

Mr. DOANE: With respect to the threatened attack upon the companies next year, may I ask whether it is proposed by the directors to do nothing till Parliament meets, or whether they will join with the other companies in seeking an interview with the Government upon the subject during the recess, as was done before? I mention it now because, when Parliament meets, the special department of the Government with which we have to do, is always much occupied.

The GOVERNOR: You are aware that we acted with a committee of all the companies last year. That committee has not been broken up, only adjourned *sine die*, and no doubt they will have an opportunity of addressing the Government on the subject. With regard to the Board of Trade, I do not think the companies will do much good there, as, for some reason or other of their own, they have mixed themselves up with gas affairs in a very extraordinary manner. The letter of the board on this question was a most singular production, for while on the one hand it affirmed what had been stated by the Chancellor of the Exchequer and the President of the Board in the House of Commons, on the other hand it urged the adoption of the sliding scale. On the one hand it asserted that the Government would not assist in any attempt to break up the understanding upon which the companies had raised their capital, in the next paragraph it propounded a very different condition of things for regulating their business in the future. I would far rather now address the Government themselves than the Board of Trade department, and I have no doubt we shall communicate with them.

Mr. FORD: Does it occur to the honourable proprietor as to what suggestion should be made by this company to the Government?

Mr. DOANE: I think the point which should be impressed upon the Government is the injustice of binding the companies to supply gas at a low initial price, the cost of the material from which it is manufactured fluctuating, from causes beyond their foresight and control, the effect of which would be to make the dividends uncertain.

Mr. SLATER: Has any proposition been made to the promoters as to disposing of our works to them?

The GOVERNOR: We have made none.

Mr. SLATER: Have they made any proposition to you?

The GOVERNOR: Only the proposition contained in the Purchase Bill of last session, to take the price of shares on an average of three years, and give us

that. But that is not what we could accept. One result of their offer was to add about 25 per cent. to the value of our stock.

Mr. SLATER: They would also take your plant at a valuation?

The GOVERNOR: I do not know what they would do; they have not submitted such a proposition. We told them that we were perfectly willing to sell at a fair valuation, and there is no difficulty whatever in ascertaining what the value of our property is. There is ample basis for a calculation, as many companies have already been sold to municipal bodies throughout the country.

Mr. FORD: I consider the true policy of the company is not to take the initiative, but to remain on the sure foundations of the contract made between Parliament and the proprietors who have invested their capital in the concern.

Mr. SLATER: But it is very vexatious to have to defend ourselves from these attacks.

Mr. FORD: All proprietary rights have to be defended.

The motion was put and carried.

The GOVERNOR moved—"That the following dividends be declared for the half year ending the 30th of June last—viz., the fixed dividends on all classes of preference stocks and shares, and a dividend at the rate of 10 per cent. per annum on the ordinary stock, such dividends to be payable on the 15th inst."

The motion was seconded, and carried.

The meeting was then made special, for the purpose of conferring on the directors power to issue the loan capital authorized by the special Acts of the company by means of debenture stock, instead of debentures, in the manner prescribed by the Companies Clauses Acts of 1863 and 1869.

The SECRETARY having read the notice,

The GOVERNOR proposed a resolution to that effect. He explained (as stated in the report) the convenience and advantage arising from the proposed substitution, and replied to some inquiries by shareholders as to the intended mode of issue. The conversion into stock of the bonds not yet due, would, of course, be at the option of the holders. The directors thought they should be able to float the whole at 4½ per cent.

Mr. FORD said, in his opinion, the directors should raise the money on debenture stock from among the shareholders of the company, and with that money pay off the bondholders, and not give the latter the privilege of converting their bonds into stock.

The CHAIRMAN, in reply, said a very large portion of the debentures were taken up at a time when they could not have floated them with the public, and he thought it would be rather hard to take the advantage from the holders now.

Mr. SLATER seconded the motion, which, after some conversation, was put and carried, with the addition of the words "the interest on such stock being at a rate not exceeding 5 per cent."

Mr. FORD moved—"That, in the opinion of this meeting the debenture stock authorized by the last resolution should be offered *pro ratâ* in the first instance to the ordinary shareholders of the company, and then to the preference shareholders.

The DEPUTY-GOVERNOR seconded the motion, which was carried.

On the motion of Mr. NORTHOVER, a cordial vote of thanks was given to the directors.

The GOVERNOR acknowledged the compliment, and the proceedings terminated.

BIRMINGHAM GASLIGHT AND COKE COMPANY.

The Half-Yearly General Meeting of Shareholders was held on Monday, the 11th of October—Mr. J. T. COLLINS in the chair.

The following report and statements of account were presented, and taken as read:—

Your directors, in submitting the usual accounts for the half year ending the 30th of June last, have to report that they have now settled with the corporation the total amount to be paid to the company on revenue account from the 1st of January to the 1st of September, the day on which the transfer was completed. The amount agreed upon provides in addition to the balance of profit to the 30th of June, a sum of £8739 13s. 4d. to cover one-third of the estimated profit of the current half year—the agreed proportion for the two months from the 1st of July to the 1st of September—and your directors feel assured that this settlement will be satisfactory to the shareholders. The ultimate balance of profit shown by the present accounts amounts to £29,916 13s. 10d. which your directors propose to deal with in the following manner—namely, to pay dividends at the maximum rate of 9 per cent. per annum on the A and B shares, and 7½ per cent. on the new ordinary shares, for the half year ending June 30, and also the maximum dividends for the two months from that date until the 1st of September. This will absorb £15,992. If the company had continued its operations, the remainder would not be dealt with until the next ordinary meeting in March, 1876, and is, in the meantime, subject to the expenses of winding up, and any amounts which may be legally chargeable against the company; the directors believe, however, that no substantial amount remains undischarged, and they therefore propose that a further sum of £7500, be at once distributed among the shareholders, in order to make up the dividend of 5 per cent. paid for the year 1873, to 7½ per cent. on all classes of shares. Strenuous exertions were made to get clauses for facilitating the winding up inserted in the Act, but without success, and the directors are advised that, in the interests of the shareholders, and for the purpose of rendering the next division absolutely final, and not liable to any after deduction, it is desirable to take advantage of the provisions of the Companies Act, 1862. For this purpose it will be necessary to register the company under that Act, in order that it may be wound up, and your assent to this being done will be asked at the extraordinary meeting.

Dr. *Profit and Loss Account for the Half Year ending June 30, 1875.* *Cr.*

Expenditure.				*Income.*			
Management—				Sale of gas, after deducting discounts, adjustments, bad debts, and expenses of public lamps	£55,440	12	9
Office salaries and collectors commissions	£1,808	12	6	Coke and breeze, after deducting labour, expenses, discounts, and bad debts	12,827	0	11
Fees to directors and auditors	470	0	0	Tar, ammoniacal liquor, profit on fittings, and sundries (less discounts)	7,716	7	8
Stationery, bookbinding, printing, postage and receipt stamps, and incidental expenses	402	8	1	Rents receivable	395	8	9
Manufacture—				Cash discounts on purchases	193	19	4
Coals, including tonnage and delivery	38,067	3	3				
Purifying materials and wages	453	1	10				
Supervision, labour, retorts, tools, and implements, with ordinary repairs	10,206	12	4				
Distribution—							
Ordinary repairs, and maintenance of mains, with costs, repairs, and renewals of services, wages of meter inspectors, &c.	1,358	19	7				
Meters—							
Restoring and maintaining	773	1	10				
Rents, rates, and taxes—							
Rents payable	349	7	8				
Rates and taxes	1,423	3	9				
Law costs & continuous audit	157	5	6				
Interest on loan capital	2,002	8	6				
Bank charges	212	13	9				
Costs of Birmingham Gas Bill No. 1	516	3	11				
Balance carried to balance-sheet	18,312	6	11				
	£76,573	9	5		£76,573	9	5

Dr. *Profit and Loss Account continued from July 1 to Sept. 1, 1875.* *Cr.*

To balance in hand	£29,916	13	10	Balance June 30, received from the corporation	£20,760	6	8
				Cash to the credit of revenue at the bank on new account, prior to settlement with the corporation	416	13	10
				One third of the estimated profits of the current half year, received from the corporation in settlement of the profit accruing to the company for the two months ending September 1	8,739	13	4
	£29,916	13	10		£29,916	13	10

The CHAIRMAN moved the following resolution:—"That the report and statement of accounts now read be received and approved, and that the following dividends be declared:—viz., a dividend at the rate of 9 per cent. per annum on the A and B shares, and 7½ per cent. on the new ordinary shares for the half year ending June 30, 1875, and for the two months following; and also that there be paid out of the balance of revenue account a further dividend of 2½ per cent. on all classes of shares for the year 1873, making, with the dividends previously declared for that year, 7½ per cent., and that such dividend warrants be issued forthwith." In moving the resolution, he remarked that the working of the company during the past half year had been very satisfactory was evident from the result. The directors had also in the transfer to the corporation on the 1st of September, arranged it upon a basis which must be satisfactory to the shareholders, since it acknowledged a large amount of profit which enabled them to pay the dividends for the two months since the close of the half year, and one of the back dividends for the year 1873. He had been requested to mention that the back dividend for 1873 would be payable to the present holders of the shares, and not to the persons who held them in 1873, as some inquirers had thought.

Mr. BULLOCK seconded the resolution, and said he thought the shareholders would agree with the chairman that the present, although it would probably be the last of the ordinary meetings, was one of the most satisfactory they had ever had. Difficulties arose with the corporation as to the drawing up of the balance-sheet, but, owing to the good feeling and good sense shown on either side, they were overcome. The estimated profit for the two months of the present half year was set down at £8739. If they multiplied that by three, it would show a profit for the whole half year of nearly £27,000, or a sum which would give them a great deal more than two maximum dividends. The corporation had dealt with them very liberally, and he wished publicly to acknowledge the good sense and good feeling which had been shown by the Mayor and Gas Committee in their communications with the directors of the company.

Mr. HARDING asked for an explanation of the item in the balance-sheet of £6810 for costs and payments in respect of land.

The CHAIRMAN said the sum in question did not come out of the company's profit. The land was for the extension of the works, and its cost was a matter of capital, which would be paid by the corporation. It did not affect the shareholders at all.

Mr. BULLOCK said it really was a deposit of money to secure a friendly purchase of the land.

The resolution was put and carried.

Mr. BOLTON said that, at the meeting in March last, he gave notice that, in order to show their high appreciation of the unwearied attention of the directors, and the successful manner in which they had rescued the company from the painful position in which it stood in 1872, he should propose that the remuneration formerly granted to them should be restored. In August last a resolution was suddenly put in his hand, which went further than the proposal of his own mind. It was to the effect that the increased remuneration should date back to March, 1872, instead of 1874, as he had intended. When he saw the hesitation with which the resolution was received, he gladly complied with a suggestion to withdraw it, and bring forward a modified resolution at a future meeting. They now had earned not only the maximum dividend, but sufficient to repay the deficiency which there was in 1873. He thought the diligence and attention shown by the directors justified the shareholders in acting towards them in a liberal spirit, and he had, therefore, much pleasure in moving that, taking into consideration the very able and successful manner in which the directors had conducted the affairs of the company for the last two or three years, and the satisfactory conclusion of their negotiations with the mayor and corporation, the meeting should not only vote their warmest thanks, but should place the sum of £1000 at their disposal as an acknowledgment of their valuable services.

Mr. PHILP seconded the resolution, and suggested that it would have been the proper thing if the old directors had returned to the shareholders their fees for the year in which they allowed the company to fall into disaster.

Mr. BOUGHTON supported the resolution. He sincerely hoped that it would be carried in a handsome manner.

In answer to a question, the CHAIRMAN said there would be a balance remaining over and above the £1000 proposed to be voted. It would be kept for the winding up, and then, when all claims were satisfied, whatever was left would be divided amongst the shareholders. The directors did not anticipate any very heavy claims.

The resolution, on being put to the meeting, was negatived by 14 votes to 12.

A vote of thanks to the auditors having been adopted,

Mr. PHILP, referring to the defalcations of the late secretary, said he believed a promise was made that a sum should be kept in hand in order to prosecute the individual in question, if he came within reach. He wished to know what would be done with that fund when the company was wound up.

The CHAIRMAN said the directors still considered that the fund was in hand. When they came to the final winding-up of the company it would be a question whether that fund should be retained or not.

The meeting was then made special, and the CHAIRMAN moved the following resolution:—"That, for the purpose of winding up the company, the directors be and are hereby authorized, if they think fit, to register the same under the Companies Act, 1862; and also to take all other such proceedings as they may consider necessary or desirable for the winding up of the company." The chairman explained that it was proposed only to give this power to the directors, so that they might adopt this course if they thought fit.

Mr. BULLOCK seconded the resolution. He said he thought the late Act of Parliament gave the company sufficient power to wind up; but their solicitor advised them that the better course would be to register the company under the Companies Act, 1862. The resolution would give the directors power to adopt that course if, after further consideration, they should be satisfied that it was the best.

The resolution was put and carried.

A vote of thanks having been given to the chairman,

Mr. BULLOCK referred to the resolution brought forward by Mr. Bolton, and which had been rejected by the meeting. Nothing, of course, would have been said upon the matter by the directors had it not been brought forward by a shareholder. The sum proposed to be voted would not have been a recompense for the labour the directors had bestowed, but an acknowledgment of good faith and fellowship for the manner in which they had pulled the company round. There had not even been a vote of thanks to the directors; but he supposed that was an oversight. When the committee of inquiry was appointed, and with

which he was associated, the members gave six months of their time, meeting often three times a week, from ten o'clock in the morning till six in the evening. He believed the things that committee worked out, and the report they presented, were the foundation of the subsequent success of the company. The remuneration they had received had been simply nothing, considering the time and labour expended. If some smaller sum, even sixpence, had been voted to the directors, he should have looked upon it as some acknowledgment of their services; but they had rejected the resolution, and he should go away from that room looking upon it as a fact that the shareholders had not the strong confidence, and did not appreciate their services in the way the mover of the resolution thought they would have done.

The proceedings then terminated.

WEST OF SCOTLAND ASSOCIATION OF GAS MANAGERS.

(*Continued from p.* 477.)

Mr. MONK (Lanark) read the following paper on

MALAM'S PROCESS OF GAS-MAKING.

As a reintroduction to the discussion on the "Malam Process of Gas-Making," it seems to me an apology is necessary for taking up the time of this meeting, after so many expressions that there is nothing in it, especially the opinion of "Anti Clap-trap."

As the process was first brought under the notice of this association, and Mr. Malam being a member, in the absence of any reliable details of working the process other than his own report, I consider it necessary to continue the discussion on this subject until we disapprove of it on satisfactory grounds, or otherwise show there is some benefit in working it, and after giving you my opinion on it, I propose that a committee of this association be appointed to-day, and that Mr. Malam be requested to allow an investigation, and experiments to be carried on at his gas-works for such a time as they can arrange to stay at Dumfries, and report to us at next meeting, or as early as possible through the JOURNAL OF GAS LIGHTING the expense of the said committee to be paid from the funds of this association, so that we may have some practical solution of the question other than Mr. Malam's own report. And why I am of this opinion is, that it is the only new thing brought out to supersede the ordinary method of gas manufacture of late years, showing a balance in its favour after six months working, and the only practical process on an ordinary working scale.

It will be as well to take a review of what is known of the "Malam" process, because he shows, at present prices of coals, a saving of £1000 a year on a comparatively small manufacture of 30 to 40 millions a year.

In March, 1873, when Mr. Malam brought this subject before this association at Kirkintilloch, he claimed a saving of 10 per cent., and stated that the whole of his works were being remodelled on his new plan, there being six retorts fewer required, and 700 tons of coal less used for the year when only partially adopted; the patent claimed being a small water-tank on mouthpiece, and washing the inside of ascension-pipe to prevent choking, and the use of incandescent coke in 3 to 4 feet of one end of retort, it being maintained at excessive heat to convert lighter hydrocarbons in the tar, in passing over incandescent coke into a permanent gas, by which he claimed 4000 feet, per ton, of gas, more than any other man by the ordinary method of carbonizing. At the Hamilton meeting, March, 1874, he handed round a circular and read a paper, drawing a comparison of working by ordinary method, and by his patented process. For the three months ending Jan. 1, 1872, there had been carbonized at the Dumfries Gas-Works 1637 tons of coal, producing, as indicated by station-meter, 14,790,000 cubic feet of gas—*i.e.*, 9024 feet per ton by the ordinary method of carbonizing, and previous to the application of any part of his improvement. During the corresponding period of 1873, when only a portion of his improvements had been added to the works, the number of tons of coal carbonized was 1335, producing 13,510,000 cubic feet of gas, or at the rate of 10,119 feet per ton—*i.e.*, increase 1095 feet per ton in the corresponding period ending Jan. 1, 1874; with the full adoption of every improvement, there was carbonized only 951 tons of coal, yielding 12,530,000 feet per ton—*i.e.*, increase 4141 feet per ton, representing a saving of the price of coals at that time of £596 in three months.

During the time specified he informs us the same description of coals were used, and the gas produced by the new process equal in illuminating power to the old, and that it was also more permanent. At the same time he produced a certificate from Dr. Stevenson Macadam, that only 2 per cent. of the lighter naphthas was left in the tar—very desirable results I have no doubt we are all anxious to gain.

In the discussion that followed, Mr. Malam repeated his belief in producing 4000 feet per ton more than any other man. And Mr. Key, then president, said his experience bore out that of Mr. Malam, and a result much against his expectation, decreased unaccounted-for gas (but less the much greater volume obtained by Mr. Malam's process, I presume he meant). After hearing the foregoing extraordinary statement, I freely expressed my opinion that the "Malam" process was the best and most simple new plan of carbonizing I had seen or heard of. I was so much struck by the statements made by Mr. Malam, that I went to Dumfries a short time after, being anxious to adopt such an extraordinary paying plan, as no works stood in greater need than Lanark, and I was desirous of adopting the very best, and I will certainly give Mr. Malam the credit of having the finest heats I ever saw. I have had very many opportunities of seeing almost every kind of retort setting in all parts of Europe, and in works from the largest in England and the Continent to the very smallest. But, after further consideration, it has appeared to me the greater wear and tear of retorts, extra cost incurred working the process for pumping water, &c., and loss of value of tar and ammoniacal liquor, and royalty, is equivalent to greater portion of increased volume of gas obtained; and being doubtful of quality of gas, as it seemed to me the action of the highly-heated coke was simply to do that which is done by high heats in ordinary retorts—viz., decompose some of the higher illuminants in the gas, and thereby produce quantity at expense of quality, except from what usually passes away to tar-tank even with high heats—a small quantity in my opinion—and it is that small quantity of liquid hydrocarbons we have to define, and see if the value of them will pay to work the "Malam" process, or any other to gain more gas from what usually passes to tar-tank, and reduce Dr. Muspratt's opinion to practice. It is the value in sperm we have to look to, not volume; and all things considered, I am still of the opinion it is better, in the absence of comparative details in favour of the "Malam" process up to this time, to at once have an investigation as proposed; till then it is presumption of any one to condemn it. I am convinced, as no doubt Mr. Somerville, of Dublin, is, though little is gained, certainly nothing is lost by working the process for isolated districts, where tar and ammoniacal liquor are of little value, and coke, or only the two former, gas high in price, no standard compulsory to maintain, and carriage of coals heavy. Under such conditions it may be found a profitable system of carbonizing, especially for rich gas-producing materials; but only where first-class fuel is obtainable for keeping up heats.

Though I do not by any means think Mr. Smith, of Aberdeen, has settled the subject, still he has proved that, unless very high heats are maintained, the incandescent coke is no advantage.

Very much has been said about there being nothing new in this "Malam" process, except the small water-tank on the mouthpiece, and the shower of water passing down inside the ascension-pipe. The latter, Mr. Paterson, in his inaugural address at Leeds, stated had been used 28 years ago to his knowledge; yet it seems to me we are greatly indebted to Mr. Malam for having brought it under the notice of the gas world again. There is only one other subject that his process has suggested to my mind—viz., whether his system and high heats in general produce gas that is more condensable, and conduces to a higher rate of unaccounted-for gas. Here is a communication I prepared and sent to the Editor of the JOURNAL OF GAS LIGHTING some days before the Dundee meeting, expecting a discussion would take place there, and hoping my remarks would elicit something more definite, and settle the question more than was done, because there is so little time, when so many subjects are taken up, to get practical information by discussion from any one of them, as it is scarcely fair to prevent members reading the papers after the trouble of preparing them. But the Editor having received notice of the Dundee meeting at the same time, considered it best to wait until the meeting was over, seeing it was intended to discuss the subject there; so I had my communication returned, thinking it advisable to read it here. I will now read it:—

"Sir,—Having noticed in the JOURNAL OF GAS LIGHTING of the 8th of June last ('Trade Notes from Scotland') that Mr. Foulis, of Glasgow, is about testing the 'Malam' process of gas-making at Dumfries, to compare it with the ordinary system, and see if any advantage is really to be gained by partially adopting it, with your permission I would add a few remarks thereon, if you think my suggestions worth a place in the JOURNAL OF GAS LIGHTING. My only wish, in adding a little to the controversy, is that some practical reliable information may be elicited for the benefit of the gas world generally, and for Mr. Malam himself, too, and get something definite from the conflicting information so far. Although now stated by several—and especially by Mr. Paterson in his inaugural address at Leeds—that even the jet of water to cool the ascension-pipe had been applied 28 years ago, still we should give Mr. Malam credit for invention himself, if such has not been published before, and thank him for again bringing the process before the gas world, as the scientific knowledge of the present day is more capable of defining the utility and errors of the system.

"Many managers in the West of Scotland will be disappointed that the testing is not to be at the Dalmarnock or Dawsholm works at Glasgow, with specially prepared works, or their experimental works altered—an ordinary works I presume—and a retort of each kind fixed, or one on 'Malam's' plan, stopping the 'Malam' process one charge (and put it on the next), using the same quantity of coals both times, but spreading over the whole length of retort when the 'Malam' process is not in operation. And 1000 yards of 3-inch or 4-inch pipes, say T and B pipes, laid for the purpose of testing how far endosmose and exosmose, by practice from cast-iron piping, affect the quantity of gas unaccounted for by each system, and what difference of quantity and quality by each system after standing for comparative periods—say 24 hours at least—between the gasholder and 1000 yards of main-pipe.

"There have not been any definite reliable details, as yet, how far gas produced by each system is affected by transit and condensation. And a great deal of theory has been advanced that gas made with excessively high heats is not so permanent as supposed.

"As Mr. Foulis will no doubt have the co-operation of Dr. Wallace in his experiments, and time and expense are no object, it is desirable that the whole gas world should get the benefit of their testings, and that the proper limit of working heats should be defined. As there are large areas of ground, large quantities of pipes, and large staffs of workmen at command in works such as those at Glasgow, the cost is reduced to a minimum, and the citizens of Glasgow may probably get full value for their outlay in an improved system of working afterwards. My suggestions are, of course, equally applicable to other gentlemen endeavouring to find out the advantage to be gained by working the 'Malam' process—if any—as there seems to be a certain limit to work heats that will produce gas retaining its permanency to the point of consumption, and that the prevalent idea of working heats as high as possible is erroneous.

"A scientific inquiry and comparison in all details is much needed to prove if even 2000 feet per ton of gas more, of as good illuminating power, can be taken from coals, cannels, or shales by the 'Malam' process, and give equivalent of extra expense working thereby and loss of residuals.

"That more can be taken off by the 'Malam' process no practical man can doubt, because a certain quantity of permanent gas must be made from a portion of the liquid hydrocarbons, usually passed to tar-tank and condensers, in their passage through the highly heated incandescent coke; but, if there is not fuel at command to get the heat necessary, the incandescent coke is useless. Mr. Smith proved it so, for he got better results by the heats as usually employed by ordinary system.

"Although Mr. Malam stated that he could get 4000 feet per ton of coal more than any other man, we should excuse him, as no doubt he was elated with the success of his first year's working by his new process (over his past working) at the time. At the Hamilton meeting, March, 1874, he stated that, for the three months ending Jan. 1, 1872, he only got 9024 feet per ton; and, when all improvements in action, for three months ending Jan. 1, 1874, his return was 13,175 feet per ton—*i.e.*, increase 4141 feet per ton—but was he taking off anything like the proper quantity at 9024 feet per ton before Jan. 1, 1872, and did he use same coals after. He forgot that others can increase the volume of gas by increasing heats from 1560° to 2800° Fahr., manipulating by various means, and using minerals giving from 5000 to 15,500 per ton, and that there are 150 various kinds of coals, cannels, and shales in Scotland fit for gas-making; and the man who gets 5000 feet per ton, at the price he pays for it, may be doing as well as the one who gets 15,500 feet per ton, all things considered, or even 20,000 by an auxiliary process. But that is not the question for gas managers; generally they have a standard to maintain, and whether it is best, all things considered, to produce great volume, and in many instances in winter where caking coals are used, keep on a staff to keep apparatus and mains clear of naphthaline, and use 10 or 15 per cent. of dear cannel to bring up the quality, or work moderate heats and produce the quality required; in brief, can the equivalent of pounds of sperm be taken from coals or shales, and conveyed to the consumer to a greater degree by one process than another. Dr. Wallace stated in Oct., 1874:* 'I made a series of experiments, the 25th and 26th of September last, at the Dumfries Gas-Works, and got from Lesmahago and Longlee cannel coal 13,565 feet of 31-candle gas, round numbers, equivalent in sperm 1442 lbs.; then we put on the exhauster, and got 15,125 feet of, say, 29 candles, or equivalent in sperm, 1505 lbs.' When, by ordinary process—laboratory test—he got 12,450 feet per ton of 33·13 candles; equivalent of sperm per ton, 1414 lbs. This latter was such perfect working, he doubted if such results could be obtained on a large scale. So far, then, we have evidence of liquid hydrocarbons passing incandescent coke, increasing volume, and also equivalent of pounds of sperm—viz., 91 lbs. of sperm increase per ton of Lesmahago coal, and, of course, proportionately less as inferior coals are used; but does the increased quantity go to the point of consumption.

"At the Hamilton meeting, March, 1874, Mr. Malam stated the gas made by his process was more permanent than that produced by ordinary system. What evidence have we to this effect? The engineer's report to Dundee Gas Commission, Sept., 1874 (*Dundee Advertiser*, Sept. 3, 1874, and JOURNAL OF GAS LIGHTING of Sept. 15, 1874, page 370), says that a gentleman who had an opportunity of testing the process at Dumfries, was under the impression it would not do; that the unaccounted-for gas by the books was 28 per cent., and yet the mains are said to be in first-rate condition and size. This was contradicted by Mr. Malam and Mr. Nelson at the Lanark meeting (see JOURNAL OF GAS LIGHTING, May 25, 1875, page 770) that the mains are not

* See Mr. Nelson's circular, read at Dundee Meeting, JOURNAL OF GAS LIGHTING, July 27, 1875, page 155.

in good condition, not being all overhauled yet, and that there is only 16 per cent. unaccounted for at Dumfries. Would they kindly furnish us with name of gentleman who furnished the information to Mr. M'Crae, of Dundee, after examining the books of the Dumfries Gas Company, and which is correct?

"As much has been done since the amalgamation at Dumfries to make mains sound and free from leakage, if gas is more permanent, where does even the 16 per cent. go to? Does the working of high heats cause a greater degree of endosmose and exosmose, or is the highly-heated coke producing a gas from liquid hydrocarbon passing through it from some other cause less permanent? The detailed balance-sheets of the Dumfries Gas Company for the years 1871-2-3-4 would, in my opinion, throw more light on the subject if they were printed and circulated to the public.

"If the experimenters conduct their testings at Dumfries, how will they know what gas is unaccounted for by each system, when consumption from mains will be varying, and if confined to the works, the endosmose and exosmose through wrought iron of gasholder will not be the same as from metal pipes, laid in earth 18 inches or 24 inches deep.

"Unless a certain length of main is laid perfectly tight at 4 inches pressure to commence, and gas measured going into holder with corrections for temperature, and photometer fixed there, and meter and photometer fixed at the outlet end of 1000 yards of main, or cubical contents of gasholder taken for gas lost in 24 hours, and five kinds of minerals used—first and second class cannel, a shale, and a splint, say, 'Haywood' as a sample of Scotch splints, and 'Climpy Tripping' (with cannel picked out) as equivalent to English caking coals, each of the latter well known to Dr. Wallace, at least 10 cwt. of each tested each time, and gas thoroughly exhausted from the gasholder; *i.e.*, at each experiment, gasholder resting, and pressure off, and careful comparison at each of the ten trials in every detail, especially heats by calorimeter, and first-class fuel at command, and heats all through the testings, the 'Malam' process against the ordinary method of carbonizing will not have an exhaustive trial.

"If it will pay to work the 'Malam' process, any works using two sets of retorts (where coke is of little or no value)—one to produce fuel from inferior gas-producing coals, and one to work rich gas-making mineral, of which there is such abundance in Scotland to be had cheap, though residue is of no value as fuel after having been carbonized—the same could be utilized for gas-making to the great benefit of the country at large, gas consumers and companies in particular; but at present, when such are used without abundance of good fuel to maintain high heats, in most cases gas managers get only abuse, because their returns do not show a favourable return per 1000 cubic feet per ton carbonized.

"Mr. Malam's process, and every other new system which appears reasonable, should have a fair and impartial inquiry, without prejudice to inventors, or want of charitable feelings. What are gas managers associations for, but to thoroughly sift interesting subjects? and when members stumble, some one more clever pick them up, set them right, and so encourage a mutual interchange of opinion, forgetting all the puffing, but by all means avoiding the rule of thumb work; and let them be taken up by associations, or wealthy corporations such as Glasgow, and conducted in a scientific manner, and then probably from all the smoke, tar, and acid we shall have more light.

"*Gas-Works, Lanark, June* 25, 1875." "L. MONK.

I do not suppose the process is of much service for ordinary caking coals, because gas companies in England generally and abroad are bound down to a standard which would prevent them taking off more then they generally do by their ordinary heats, and the small quantity of liquid hydrocarbons left in their tar would not make up the quality of increased volume obtained. Probably where residuals are of little value, they may find it profitable to work the process, if tried by plan I proposed when writing to Mr. Nelson for information of the "Malam" process, which I will now read:—

Gas-Works, Lanark, Feb. 27, 1875.

"Dear Sir,—Is there any reliable information of the comparison of 'Malam's' retorts, against others on the old plans of working? I have not seen any in print yet, except his own report, which is contradicted by the report in the *Dundee Advertiser* of Sept. 3, last year:—

"DUNDEE GAS COMMISSION.

"Yesterday a meeting of this commission was held—Mr. Moir presiding.

"*Engineer's Monthly Report.*—The engineer's monthly report showed coals in stock, June 30, 1874, 3788 tons 6 cwt. 1 qr.; coals received during July, as per steelyard book, 3155 tons 6 cwt. 2 qrs.; coals in stock, July 31, 1874, 6259 tons 13 cwt. 3 qrs.; coals carbonized during July, as weighed over small steelyards, 683 tons 19 cwt.; gas made during July, 7,939,200 cubic feet.

"*Malam's Process of Gas Manufacture*—Mr. M'Crae, according to instructions, had made inquiries as to Malam's process of gas manufacture in operation at Dumfries, and had received the following information from a gentleman who had an opportunity of testing the process and apparatus:—'After testing and inspecting Mr. Malam's process at Dumfries, my impression is that it will not do. We tested 10 cwt. of Newcastle coals, got 6200 cubic feet of gas; average illuminating power, 10·8 candles. As near as we could ascertain from the books, there seems to have been used at the Dumfries gas-works for the period from June 1, 1873, to May 31, 1874, about 2800 tons of coal, fully the half of which was Auchlochan; the make of gas in round numbers was 31 million. The leakage from the date we got was not less than 28 per cent., and yet the mains are said to be in first-rate size and condition.'

"Mr. M'Crae added: 'From the foregoing extract it will be seen that gas at the rate of 12,400 cubic feet was taken from the coals of an illuminating power of 10·8 candles. The same coals in the ordinary process of gas-making produces 10,000 cubic feet of 14 candles, while by comparison the latter gives light represented by 14,000, the former by only 13,392. It will also be observed that the total coals used, and the total gas made at Dumfries last year, gives an average yield of 11,071 cubic feet per ton, of which 28 per cent. was unaccounted for, by condensation, leakage, &c., or by erroneous measurement at the station-meter.

"The committee did not think it necessary to take any further action in the matter in the meantime," &c., &c.

"Any inquiries I have made are not satisfactory. When I went to Dumfries I was quite satisfied of the superiority of his heats, but doubtful of the action of the water inside the ascension-pipes on the quality of the gas, and allowing for the liquid hydrocarbons usually passing to the tar-tank and condensers being converted into permanent gas, and so causing a good quality of gas to be maintained, and the quantity greatly increased. I have not been convinced of the great gain claimed for working Mr. Malam's process in quantity and quality at consumers burners, especially quantity. What is the good of making it if not paid for? It seems to me the water inside the ascension-pipes is converted in some degree into hydrogen gas, and causes high registration at the station-meter, but does not reach the consumers. (Since writing this letter I have been led to believe that no decomposition of the water takes place, there not being sufficient heat inside the ascension-pipe.)

"I have always understood that coal carbonized at very high heats in the ordinary way is the most permanent in transit in mains, and have yet to be convinced to the contrary, although it does not seem so at Dumfries, and there is much argument used to show where high heats are in operation the greatest return is not obtained at the consumers meters.

"I want three new retorts, and, of course, would like an improved plan, but cannot recommend any new process to my directors until I have some definite and reliable information. Every gas manager must see the necessity of converting as much as possible into a permanent gas what usually passes to the tar-tank, and the 3 feet of hot coke is a good plan, even though it were only 1500 to 2000 feet per ton more, and quality and quantity maintained permanently to point of consumption a reasonable distance, showing a gross gain in candle power at consumers meters, or rather burners. My idea is to dispense with water altogether inside the ascension-pipes, having through retorts—exactly Malam's plan—and using incandescent coke, and, if found necessary, by ascension-pipes choking, use his small water-tank on top of mouthpiece, and further, to relieve stoppage, use the new 'Chandler and Stevensons' or other self-acting dip-pipe and Vincent's gratings. When charging the first time, charge the full length of retort from the end where 'Malam' does at present; before doing so, inserting the grating at the other end. When drawing, take out the grating and clean it, and draw out the coke from the end where 'Malam' has ascension and water pipes, or push the coke out, where in experimenting there is no room for drawing, and only room for a barrow. Push or draw all the coke out except sufficient to cover 3 or 4 feet of the retort as required. Push or draw that to the ascension-pipe end, insert the grating, and charge from the other end. A fresh supply of incandescent coke would thereby be brought to work every charge, and so keep it and the retort clean, and in the best condition for carbonizing. You will see objections to the plan, but I think it probable the advantage gained would more than counterbalance the objections. Perhaps you know some one in a position to try it. I am not, as we cannot afford to spend any time or money on experiments, and I think I shall have to set retorts on the old plan for another year, but I thought I would write to you first. You will remember that with Vincent's gratings (see JOURNAL OF GAS LIGHTING, report of the British Association of Gas Managers last year) there would be a probability of pipes choking where no exhauster was used, as the pressure of gas passing the apparatus and of gasholder would still be on the retorts when the dip pressure was removed.

"An answer at your convenience will oblige, yours truly,

"LEVI MONK.

"Mr. D. Nelson, 135, Buchanan Street, Glasgow."

I fear your patience is being exhausted, but I was so much annoyed by consumers stating that our gas was so dear, because we did not know how to take the gas out of coal like they do at Dumfries; and, after Mr. Smith's (of Aberdeen) report was published, blamed by my directors for losing time going to Dumfries. I, for one, will not listen to any discussion on the subject again, unless it is practical and reliable details showing some gain. I am very anxious to learn from the discussion on this subject what is the best heat to work for producing most permanent gas. The gentleman who examined the books of the Dumfries Gas Company found 28 per cent. unaccounted for. The engineer's report for the month of July, 1874, showed a produce of 11,600 feet to the ton; for June, 1875, 11,360 feet per ton; and for July, 1875, 11,280 feet per ton of coal carbonized. In the yearly report of the Dundee Gas Commission (see *Dundee Advertiser*, June 17, 1875), the unaccounted-for gas is shown—my quotations are all from the *Dundee Advertiser*, gross product and weight reduced to product per ton by myself—to be only reduced from 18·5 to 18·24 per cent. for last year; these are two instances of great production with high heats. No doubt the quality and price of coals were high also, but the quantity is sufficient for my purpose; and as Dundee is considered one of the best engineered and managed works in Scotland, we may be certain no stone is left unturned to reduce the leakage, gain correct registration, well regulated lamp supply, and economy in distribution, by perfect regulation of pressure at various levels, among the best in Scotland. It seems to me the quantity unaccounted for is affected by exosmose and endosmose, and not desirable to work too high heats. On the other hand, Mr. Key, of Dumbarton, informed us at the Hamilton meeting that, when taking off 13,500 to the ton, his unaccounted-for gas was only 2½ per cent. I will read the quotation, as I fear it is a printer's error—if not, the exosmose theory is upset:—"The Galashiels balance-sheet for past year's working"—a very excellent one, I may remark—(JOURNAL OF GAS LIGHTING, p. 157, July 27, 1875) "shows a yield of 10,107 feet per ton of good average Scotch cannels, as price averaged 26s. 11d., and only 7½ per cent. unaccounted for;" and "At Portsea, with Newcastle coals used" (see JOURNAL OF GAS LIGHTING, July 13, 1875, p. 70) "only 5·07 unaccounted for, and 9030 feet sold." These latter, you will notice, are very good average productions, and small quantity unaccounted for—very small.

Allowing Mr. Malam 16 per cent. under his exceptional circumstances, since amalgamation of second set of mains, where does the other 12 per cent. go to, if not affected by exosmose and endosmose? The latter examples contradict two former, and besides they are less concentrated districts for supply than the two former; and, of course, so much more unfavourable for condensation and leakage, and point to the average production of gas being the most profitable and most permanent in point of consumption.

I cannot see that anything definite was elicited at the Dumfries meeting last year, nor yet at Glasgow following, to prove Mr. Malam's assertion that 4000 feet more per ton of equal illuminating power was obtained by his process, or any definite quantity.

The next notice I have is the British Association report for 1874. Nothing new is elicited except the test of ordinary Newcastle coals, giving 13,400 feet of 14-candle gas; but this is contradicted by another test, showing only 12,400 feet of 10·8-candle gas, by a gentleman whose name has not transpired, replying to Mr. M'Crae's inquiry for the Dundee Gas Commission.

The next statement I have is that the system is to be applied in France and Rome, and that £5000 (of the £15,000) has been already paid for the concession by a French company. Also a large town in the West of Scotland, and Glasgow, and Maryport are about adopting the process. Then we have Mr. Somerville's statement that, by adopting the process, with some modification, he found a saving of 14s. 4½d. per ton of coal carbonized; and although his statement proves little, in the absence of definite details of working and previous working, his opinion is a weighty one, and the other favourable mentions point to there being something good in it, notwithstanding all said to the contrary, for you will recollect he wrote, increased quantity made and sold.

Then we had the subject again before the Lanark meeting, but briefly referred to, as time did not permit; and although some interesting information was obtained, nothing of further importance was elicited to hold out any great inducement to adopt the process.

Next, I think, we had Mr. Smith, of Aberdeen, repeating his report at the Dundee meeting. Evidently something was wrong with Mr. Malam's heats and working during that trial, as the quantity he states he got from either coals is considerably less than should be got by good ordinary working, if Drumpark is as good average coal as Auchlochan. I am not acquainted with the former, but the latter I have tried, and, using coke from it for firing, only got 9300 per ton; but with superior coke from splint coals I got 10,800 from Auchlochan, but proportionately less illuminating power. I may add that 7½ per cent. is, in my opinion, and even 5, for such coals as Lesmahago Main Seam, Orchard, Craignethan, Newbattle, Niddrie No. 1, Muirkirk No. 1, Wilsontown cannel, and other first and second class cannels, quite sufficient to allow from laboratory experiments. Mr. M'Crae spoke at Dundee of getting 15,000 feet per ton from "Wee Lesmahago." It must have been broken "wee" from main coal, I think, or some auxiliary process introduced. I had a trial some time ago of coal sent to me as "Wee Lesmahago," and I could not get 10,000 feet per ton of 30 candle, though just before I had 11,900 of 34-candle gas from Muirkirk No. 1. Many coals and cannels from mixed seams have not, at times, within 30 per cent. of the analysis, as no doubt many of you will find, according to quality of mixture.

We have but one object in view—to improve by more extended knowledge, if possible, and provide better gas, at as low a rate as possible in our respective positions, according to the circumstances we have to contend with. I have no doubt Mr. Malam (and Mr. Nelson too) is as anxious as any of us, and like ourselves gets all the labour, and often abuse, while shareholders and gas consumers get all the benefit; and hope they will be pleased to have another

examination at Dumfries, and endeavour to eliminate the truth and substantiate their own statements, and, if found in error, no doubt they will frankly admit it.

In conclusion, I have to thank you, gentlemen, for the very patient hearing you have given me, and trust some one will continue the discussion, and point out some new feature of the subject.

Mr. NELSON: I will take the earliest opportunity of seconding the proposition which has been made. I think it is a very valuable one. The reading of the paper and the proposition with which it concludes will let the gas world, and those belonging to gas companies, see that there is a spirit of fair play in connexion with the elucidation of all these matters, and that inventors will have some prospect of getting fair play when they introduce matters for the information of those that ought to feel interested in it.

Mr. YOUNG: It is a pity Mr. Malam is not here, in the event of a committee being appointed to make trials of his process, to make the necessary arrangements, so that the matter could have been carried out.

Mr. NELSON: I will take it upon me to say that Mr. Malam is perfectly open to receive any deputation you may appoint. I will take it upon me to promise that everything will be above board to you there, provided you do as Mr. Foulis has promised to do—namely, give him a day or two, so that there need be no misunderstanding in the matter. He may sometimes have to work stuff disadvantageous to his process, simply for the purpose of producing coke for fuel. I may allude to one or two things Mr. Monk has said. The coal best applicable to Mr. Malam's process has been very much overlooked. Mr. Malam does not propose for a moment, nor does he tell you that you can get the same results from any kind of coal you may think proper to use. Any one who understands the properties of coal knows that while with one coal there is produced 9 gallons of tar, another produces 19 gallons. By Mr. Malam's process, therefore, you will not get the same quantity of gas from each ton of coal, simply because it is out of the tar that he gets the increased quantity of gas. It is the volatile matter, otherwise convertible into tar, which he turns into gas. It is not consequently necessary to explain that; but still it is right to remind you that such is the case. The high heats with which he works enable him to make a large quantity of gas, where you with your ordinary way of working would fail, simply because of the heats not being sufficient to drive off the gas. You would distil tar instead of gas by your low heats; whereas by his high heats he distils gas. I have reason to believe that the gas is as perfectly permanent at the point of consumption as gas made in the ordinary way. I was asked if I would take a note to inform the meeting of the name of the gentleman who gave Mr. M'Crae the report. Now there were four gas managers present, and three other gentlemen who were not practical gas managers. I have gone to each of the four practical men, and not one of them admits having written to Mr. M'Crae on the subject, and they each deny having given any report of their tests at Dumfries. But I think this association ought not to take any notice of letters written anonymously. Whoever wrote the letters in question must feel ashamed of themselves. It is most uncharitable to do so, and we ought to stamp them as absolutely dishonest and dishonourable.

Mr. MONK: Which is correct—16 or 28 per cent. unaccounted for?

Mr. NELSON: I think originally it was 28 per cent.; but I believe that by taking up the old mains in a district in which there was enormous leakage, and which ruined the company which owned that district, and relaying it, the leakage was reduced to 16 per cent., or something like that.

Mr. MONK: But if every effort has been used to make the mains and the registration correct, why cannot he reduce his leakage to 10 per cent.?

Mr. NELSON: You might just as well ask me why Glasgow is 18 and Mr. Key only 2½ per cent.

Mr. MONK: What I want to know is whether this gas made at high heats is permanent or not.

Mr. NELSON: I have high chemical authorities who testify that it is for that very reason more permanent than gases made at low heats. I observe that in connexion with this Malam process there has been exhibited a spirit of asking questions. I can understand a question put in a true spirit of inquiry, but I cannot understand a spirit that prompts a man to ask questions in a carping, distrustful, unbelieving spirit. Now during the correspondence relative to this Malam process, I challenged any gentleman to say that a single fact of any importance had been upset or swept away, and I have still the proof on my side that the Malam process is in a much better condition than it was 2 or 2½ years ago. It is more profitable than it was then, and this is proved by the fact that the people of Dumfries are getting their gas much cheaper. Before Mr. Malam started his process I think they paid 8s. 4d. It was afterwards reduced to 7s., then to 6s., and the last price is 4s. 6d., and he pays a dividend of 10 per cent. No town in Scotland can show better results, considering the small make and the large capital Dumfries has to contend with. I may tell you that though I am pecuniarily reaping no profit from this patent process, there has been a great amount of heart-burning, and the discussion of the process has cost me a great deal of anxiety; but I am determined, unless something turns up to upset my belief, to remain by it until it is proved or disproved.

Mr. M'GILCHRIST: Mr. Nelson says that no statement of any importance has been upset or swept away. Now, Mr. Malam said he could make 4000 cubic feet more than any other man, out of a ton of coal. At the last meeting he went the length of saying from 2000 to 3000. That is a most important fact that has been gone back upon.

Mr. NELSON: There never was a statement made that could not be qualified. It might be that Boghead cannel coal gave so much greater a yield than an inferior coal per ton, simply because you have much more gaseous matter to act upon. In proportion to the volatile matter that is in coal he will get an increased quantity of gas.

Mr. M'GILCHRIST: But Mr. Malam said he could take 4000 cubic feet more than any other man out of a ton of coal without any qualification of his statement.

Mr. NELSON: He might have meant 4000 more than he had taken before, when his works were in a dilapidated condition. But any man who knows the matter will find a qualification for Mr. Malam. I deprecate holding the remarks of a man made in the heat of debate as binding upon him. We ought to show a little charity. The question at issue is not the getting of 4000 cubic feet more than formerly, it is a question of getting an increase, and if it is 500 feet, it is worth consideration; if it is 1000 feet, it is worth adoption. I have seen Mr. Foulis recently, and he tells me he goes to Dumfries without having the slightest feeling as to the arguments adduced. He will act fairly, and make as exhaustive tests as it is possible to make, and the gas world will get the benefit of them.

Mr. RICHMOND: As Mr. Foulis is to make this inquiry, there is no use in appointing a committee. I think Mr. Foulis's report will come to the public.

Mr. MONK: He has been going to do it for a long time.

Mr. NELSON: I hold that it is not for us to leave the matter in the hands of Mr. Foulis, or any one gas manager. It is for us, as an association, to get this matter ventilated.

Mr. MONK: I am glad to hear this frank explanation from Mr. Nelson, and I think we should not bring up the question of the 4000 cubic feet again.

Mr. M'GILCHRIST: I would not have mentioned it, but for Mr. Nelson's statement.

Mr. NELSON: That was not a fact. Any fact that Mr. Malam has stated has not been disproved.

Mr. M'GILCHRIST: He published it in the JOURNAL OF GAS LIGHTING.

Mr. NELSON: It was not stated as a fact.

Mr. MONK: It was a statement made in the excitement of the moment.

Mr. YOUNG: I am very sorry that at the ontset I raised any objection to the reading of Mr. Monk's paper, as, in the discussion which has followed, Mr. Nelson has given us to understand that he is in a position to deal with us as Mr. Malam himself, so far as making experiments at Dumfries. Mr. Nelson further says that he would like this matter dealt with in a different spirit. I am sure that there is not one here who has not done his best to deal with the question in a proper spirit, and it is only because we are convinced, from experiments which have been made, and from the experience we have, that certain statements are erroneous. It is said that it is impossible to produce an equal increase with every coal, for the simple reason that it is by the decomposition of the tars that Mr. Malam obtains the yield of gas. Now, it is a fact that some managers have tried simply to distil their tar by passing it over incandescent coke. Take 9 gallons, which is a low yield, of tar, and pass it over incandescent coke, and the result should be, according to Mr. Malam, 1000 feet of gas. Now, it is a fact that the greatest amount that can be got in this way from such a quantity of tar is just 450 or 500 feet. The excess must be got from another source, if it is a fact that he gets it. Take the best coal, and 19 gallons as the quantity of tar from which he gets 3000 feet; at the same ratio, it is a physical impossibility to get more than 1000 to 1100 cubic feet. Now, it is impossible to produce a larger yield of gas from this quantity of tar. I think there is every reason to believe that there is some other source whence he gets his increased yield of gas; and I am afraid this is the very source regarding which we have doubts. In working the Malam process, the first stage of the distillation is to produce gas, hydrocarbon vapours which can be diffused through gas, and to which ordinary gas principally owes its illuminating power, and tar vapours, identically the same as those produced by the ordinary way of carbonizing coal. The next stage is to pass those mixed gases, hydrocarbons, and tar vapours over and through incandescent coke, the sole aim being to convert the otherwise condensable tars into gaseous compounds. There is no doubt that the incandescent coke will do this, but I am afraid that, at the same time that it does so, it will also decompose and convert into comparatively non-luminous gas those rich hydrocarbon vapours to which the flame of ordinary coal gas is principally indebted for its luminosity. If we take butylene, propylene, and hydrocarbons homologous with olefiant gas, and pass them through incandescent coke, we will break them up into less complex products, such as carbon, marsh gas, hydrogen, &c., and we may have two, four, or more times the volume that we had before, but only a half, or one-eighth, or indeed almost none, of the illuminating power, dependent on the amount of the decomposition to which they have been subjected; so that, by passing the hydrocarbons over incandescent coke, instead of improving the gas, you will decrease its luminosity. This is fair reasoning from facts which, from our own experience, we know to be correct. I would like to see Mr. Malam's process a success, but my fears are just as strong as ever that there will not only be a decomposition of the tars, but a production of non-luminous gases from some of those richer hydrocarbons which, under ordinary circumstances, give luminosity to the gas. I should regret very much that Mr. Nelson or any one else should attribute to ill-feeling the remarks which were made prior to the reading of Mr. Monk's paper.

Mr. NELSON: Any remarks which I made had reference to doing away with part of our business, and not to the frank and fair discussion of the process; and as to Mr. Young, I do not know a man connected with the gas profession who is more anxious to eliminate the truth as to any process. I did not mean in the smallest degree that Mr. Young had that carping spirit of antagonism to which I referred. Mr. Young has given a reason for his doubts. Now, as I am not a chemist myself, I have a little hesitation in debating with chemists; but I am reminded of the fact that Dr. Muspratt, in his "Chemistry," under the heading of "Coal" or "Gas," I forget which, states that in the distillation of coal the products may be divided into three parts, viz.—gas, coke, and secondary products. He says it is a remarkable fact that in these secondary products there is as much volatile matter, as much light-giving property as there was in the portion from which the gas had been taken, and he goes on further to clench this by saying that he has no doubt the time will come when a more perfect method of distilling gas will be discovered, by which this will be turned to good account, and the volume or quantity of gas very largely increased. That is all I have got to say. I am not in a position to argue this matter from a chemical point of view. One thing I will say in reference to the Malam process of high heats, and Mr. Young is perfectly right, that if you reduce the heat you make your gas have a higher illuminating power; and by increasing the heat unduly you produce marsh gas. You thus increase your bulk and diminish your quality. If there is one thing more than another in Mr. Malam's conduct of his process in which he errs it is his high heats. When Mr. Smith of Darlington, and Mr. Smith of Hawick were at Dumfries during the tests, they drew Mr. Malam's attention to the fact that his heats were too high, and that he was producing marsh gas. Mr. Malam is a perfect glutton for heats; and yet the fact remains that if he increases the heats too much, he, to a certain extent, deteriorates the illuminating value of his gas.

Mr. M'GILCHRIST: We must thank Mr. Nelson for his frank admission——

Mr. NELSON: What frank admission?

Mr. M'GILCHRIST: That Mr. Malam got the increased quantity from his high heats at the expense of the illuminating power.

Mr. YOUNG: It is scarcely an admission, but an explanation. I am obliged to Mr. Nelson for his quotation from Muspratt, and I would explain, if my memory serves me right, that that chemist, in making the statement referred to, states also that, although the secondary products contained the elements necessary to give such light, were they in such a form as to be conveyed in a gaseous state to the consumer, but that it is a physical impossibility to convert this tar into a gaseous state, and at the same time retain its light-giving properties; because, if we attempt to distil it, we break it up into simpler compounds, and there is a deposition of carbon, the very element that gives light, and in that very way we destroy the element we are trying to get hold of. I think, instead of breaking up the rich hydrocarbons present in gases and tar, we should rather find means to suspend those vapours, and, by whatever means we can discover, carry them in a vaporous state to the consumer, because it is only by burning them, in the state in which they are in the tar, that we can get the amount of light referred to by Muspratt. If, in the manufacture of gas by the Malam process, we could prevent the *over*-decomposition and the deposit of carbon, we would overcome the difficulty, and have a higher yield of gas, with a smaller yield of tars.

Mr. MONK: It would be well if Mr. Malam and Mr. M'Crae would reply to us, and give some explanation of the unaccounted-for gases.

Mr. NELSON: It is a pity that we should attach any importance to anonymous communications such as that referred to in Mr. M'Crae's report to his commissioners.

Mr. MONK: It is said that 6 or 8 per cent. of the gas is less permanent, from being made with high heats. This is a point we should be satisfied upon.

Mr. NELSON: That is a point I do not wish to interfere with. It is part of your business as gas manufacturers to say whether that is the case or not.

Mr. MONK: The point we have to determine is whether there is any advantage at the point of consumption.

Mr. JEFFERY: If there is only 3000 feet to be got from Lesmahagow, what will be got from coals such as Drumpark or inferior coals? Perhaps not above 1000. Now, I think that Mr. Malam should give the highest and the lowest extra yield.

Mr. MONK: That is what we have been waiting for; but Mr. Nelson has been very frankly giving us an explanation to a certain extent.

Mr. M'GILCHRIST: As Mr. Malam has three retorts working into one holder, he could let the test done by his process stand over till a test was made as to the extent of condensation, both on the common principle and on his high heats.

Mr. NELSON: So long as you do not make Mr. Malam use a great deal of money, I am sure he will give you all freedom to make your experiments; but as to the *modus operandi* of carrying on your experiments, you must leave that to him, and you must make him an allowance. Because, if you get the benefit of his retorts, you get the benefit of a portion of his process.

Mr. M'GILCHRIST: Unless the committee appointed get the process properly tested, there is scarcely any use going.

Mr. YOUNG: I would suggest that in making the test we should ask Mr. Malam to put his apparatus in first-class order, so that a fair analysis of the results may be obtained under his system of gas-making. After Mr. Malam has done the best he can with his process, I propose that he should hand over his apparatus to us, and we shall be at liberty to convert it into the ordinary process, drawing out his incandescent coke, stopping off the water, and charging and drawing in the ordinary way. By this means we will be able to get the gas from both systems measured by the same meter, put out into the same gasholder, tested by the same photometer, the same burner, and the same candle, and I think that is the only way to get proper results.

Mr. NELSON: That will be a question for Mr. Malam; and I do not think there will be any objection, provided you fill up the 4 feet of space with a proportionate quantity of coal.

Mr. YOUNG: If I can take the same quantity of coal, employ the whole superficial area of the retort, and get the same results as Mr. Malam, then there is no value in the process.

Mr. NELSON: But with an area of 12 feet you should have a larger charge than in a retort with an area of only 8 feet.

Mr. YOUNG: I perfectly understand what you mean; but the process is only valuable so far as it represents pounds, shillings, and pence to the company. A certain cost is incurred in erecting Malam retorts, and if, by the ordinary means, and at the same expense, we can distil from the same quantity of coal the same quantity of gas of a like quality, then his process is of no use. If, on the other hand, we can, by his process, take an extra quantity and keep up quality, then there is a gain.

Mr. NELSON: If he cannot do that, then I say he has failed. I have to state, as my belief, that Mr. Malam is quite open to grant you the permission you desire.

Mr. YOUNG: We might make two days from the one process and two days from the other process, and send the gas to the public.

Mr. MONK: The different kinds of coal might be tried.

Mr. YOUNG: Mr. Malam has selected the Lesmahagow coal, for which his process is well adapted, and I think we ought to ask him to have some Lesmahagow coal, or other coal adapted to his process. If you prove the process good by one kind of coal, it will be good by all others, but, of course, in proportion to the quality of coal.

Mr. M'GILCHRIST: I think we should leave Mr. Malam to pick the coal he likes best.

Mr. YOUNG: I think he is entitled to do that, but we must see that it is the same coal that is used on both occasions. This could easily be done by breaking sufficient for the test, turning it over to mix it, and then dividing it into two equal portions for the trial by the two methods.

Mr. NIVEN: This plan is different from that proposed by Mr. Foulis, and I do not think Mr. Malam will submit to it.

Mr. NELSON: In making the experiments, it becomes a question whether Mr. Malam will not suffer, because you get the benefit of his clean, unchoked ascension-pipes. But that is a matter which can be arranged with Mr. Malam.

Mr. RICHMOND pointed out that it would be quite fair to give the committee the use of a long retort, because anybody could put in a long retort, and raise the same heat. If with his process of great heats the illuminating power was not reduced, it would show it to be a good thing.

Mr. STEWART (Greenock.): Does Mr. Malam hold that there is no reduction of the illuminating power when he takes a large yield of gas out of the coal? By my own tests when at Dumfries, I know that when I got 13,000 feet to the ton, I got 10-candle gas. That was the average; and I am perfectly satisfied that there is a loss of illuminating power in the gas in proportion to the yield taken from the coal. There is no difficulty in heating the retorts; but is it desirable or judicious to get up these heats? I know from experience that these large yields from the coal are very unprofitable. I have lately had many different coals, and I found if I wanted 11,000 feet I could not get it under 24s. per ton, and that is something over 2s. per 1000 feet. If I confined myself to 9000 feet per ton, I got it for 14s., or say, 1s. 6d. per 1000 feet. I am not anxious for these large yields. I have always gone in for a moderate yield with a moderate heat from moderately good coals. What I take to be the great principle of the Malam process is in the cleaning of the furnace. During this operation by the ordinary process, the retorts cool down and the yield is less; but by the Malam process, the coke in the end of the retort can be kept heated, so that in 24 hours you get a better yield of gas, and there is less fouling. But as it is a new scheme, it is our business to discover its merits rather than point out its faults; and I think that the committee should endeavour rather to ascertain what are the merits of the process than indicate its faults.

Mr. NELSON: Mr. Stewart will remember that at the tests we had, if we had stopped at some of the lower figures, we would only have had a small reduction in the quantity, and a much larger average of illuminating power.

Mr. M'GILCHRIST: Is the wear and tear of the retorts not great under the heat?

Mr. STEWART: The retorts will stand the heats long enough for anything that is necessary.

Mr. YOUNG said that he had listened with much pleasure to the remarks made by Mr. Stewart, both concerning the Malam process and as to the costings per 1000 feet of gas from coals giving different yields, and said that if he understood Mr. Stewart aright, the advantages to be gained by the employment of the heated coke by the Malam process were (to use the expression in a letter he had seen some time ago in the JOURNAL OF GAS LIGHTING, he thought by Mr. Newbigging), to act the part of a fly-wheel in carrying on the distillation during the cleaning of the furnace, when the retorts are likely to be lowered in temperature. He further said that, personally, he had no doubt that such would be, to a certain extent, the case; and that at the commencement of the distillation, when the coal was giving off a large volume of tarry matter, the action of the coke might be very advantageous, but he had his doubts, and he would like to hear Mr. Stewart's opinion as to whether, during the latter stages of the distillation, when the coal was surrounded with heated coke, and being at least perfectly distilled in the body of the retort itself, if this fly-wheel action of the incandescent coke would not be injurious.

Mr. STEWART replied that he had no doubt that there was a danger of over-distillation when the charge was nearly exhausted, by the coke used in the Malam process.

Mr. YOUNG then produced a drawing attached to a patent granted to Lowe and Kirkham in 1838, which showed a process where the gases from the fresh charge of coal were passed through a nearly exhausted charge in a second retort, until the fresh charge was undergoing perfect distillation in itself, when they passed away to the hydraulic by a separate stand-pipe; at the same time the second retort, being exhausted and freshly charged, the resulting gases were in turn sent through the nearly-exhausted coke in the first retort. Mr. Young thought this process preferable to Mr. Malam's, in so far as the heated coke was concerned, as by it full advantage was taken of the decomposing action during the earlier stages of the distillation, and over-distillation prevented by removing the gases from the retort during the later stages of the distillation without being acted upon by the coke; and that it had the further advantage that the coke was constantly renewed, and that smaller retorts would be required, as the whole internal surface was constantly in use carbonizing coal.

Mr. NELSON pointed out that, by the Malam process, the coke could be regulated to produce any desired amount of decomposition of the products of distillation, by increasing or diminishing the quantity of coke in the back-end of the retort.

To show how nearly processes might be repeated, and the same ground travelled by different parties, Mr. YOUNG further referred to a second sheet of drawings attached to the same patent, showing an arrangement of retorts very similar to Mr. Scott's, of Musselburgh; the only essential difference being that instead of placing the outlet for the gases at the very bottom end of the retort, as in the Lowe and Kirkham patent, and thereby allowing the steam from the quenching of the coke to pass away as such with the gas, Mr. Scott places the outlet from his retort a considerable way up the side, and thereby causes the steam to come into contact with the incandescent coke, and be decomposed into hydrogen and carbonic oxide, which, combining with the richer gases near the exit-pipe, add to their volume, and combine with and suspend rich light-giving hydrocarbons.

After some further conversation relative to other processes which in past years had been patented, a sub-committee was instructed to proceed to Dumfries to carry out the necessary tests; and on the suggestion of Mr. STEWART, it was considered advisable that the sub-committee should co-operate with the sub-committee to be appointed by the North British Association for the same purpose.

As it was now half-past two, Mr. YOUNG said that, seeing the day was so far advanced, and that it would be impossible to enter into anything like a full discussion of his paper, and, further, as he had not had the necessary time to devote to the more perfect preparation of his notes for the discussion, he would prefer that it should be deferred to a future meeting, when he hoped to be able to open the discussion by a paper on the subject.

THE NEXT MEETING.

It was agreed that the next meeting of the association should be held at Greenock in the beginning of April, 1876.

After a discussion, on a suggestion made to the committee as to the expediency of asking the various gas companies to supply their managers with a gratis copy of the JOURNAL OF GAS LIGHTING, it was agreed, and the committee be instructed to prepare a circular, and the secretary to transmit copies thereof to the different gas companies in Scotland, whose managers were connected with the association, urging upon such companies the desirability of furnishing their managers with one copy per week of the JOURNAL OF GAS LIGHTING.

Votes of thanks to Mr. Monk for his paper, to Mr. Watson for the arrangements he had made for the meeting, and to the president for presiding, brought the meeting to a close.

Later in the day the members dined in the Caledonian Hotel—Mr. DUNLOP presided, and Mr. MONK discharged the duties of croupier.

After partaking of a most excellent dinner, the usual loyal toasts were proposed and duly honoured, and then "Success to the North British Association," coupled with the names of Mr. Stewart, of Greenock, as their president, and Mr. Scott, of Musselburgh.

Mr. MONK regretted his inability to do full justice to the occasion, and that it had not fallen to the lot of some one more able; but, at the same time, he was pleased to have the opportunity of taking exception to a statement (made, no doubt, unwittingly) of the editor of the JOURNAL OF GAS LIGHTING, in the number for June 23, 1874, when commenting on the formation of the German, American, and a second French Gas Managers Association, "that the British Association of Gas Managers had been the fertile parent of several similar societies." He (Mr. Monk) desired to render honour to whom honour was due, and though it might seem presumption in him, one of the youngest members of the "North British," yet he could not refrain from claiming for it the honour of being the parent society. The pioneers of gas managers associations were Mr. Paterson, of Warrington, but then of Berwick-on-Tweed; Mr. Scott, of Musselburgh; and Mr. John Young, then of Dalkeith, who met at Berwick at early as 1853, and were joined by Mr. Robb, of Haddington, shortly after. They met regularly for the interchange of opinion until the formation of the North British in 1861. It was a pleasure to know that all were hale and hearty yet, and doing good service to gas managers associations. In writing to Mr. Paterson, of Warrington, for confirmation of his being one of the pioneers, he took occasion to remark that when the British Association was formed in 1863, at Manchester, the rules of the North British formed the basis of the rules adopted for the management of the British Association, for he was present, and that previously the managers as a whole were very reluctant to communicate to others what they themselves knew. Mr. Paterson further remarked that he looked back with feelings of pleasurable emotion to the enthusiasm with which the science was prosecuted in his early days, and confessed, to the honour of his old associates, that he received much more benefit from his intercourse than he was capable of giving at that time, which laid the foundation of a sound practical knowledge that has been of unspeakable service to him in more recent times. Mr. Monk continued: Most of us have seen a confirmation of all Mr. Paterson states, and, thanks to gas managers associations, when we call at a gas-work now, and state who we are, there is no jealous feeling that we call to pump all the information we can get, but a courteous kind, hearty welcome, of which we could have no greater confirmation than in our reception here by Mr. Watson yesterday and to-day.

The toast was then received with all honours, after which Mr. STEWART appropriately replied, and a pleasant evening was spent, with a visit to the Wallace Monument on Abbey Craig, where song, sentiment, and dance concluded the evening's enjoyment.

PRESENTATION TO MR. SAMUEL HUNTER.—On Saturday, the 2nd inst., the officials and *employés* of the Rochdale Corporation gas department met together in the large rooms over the meter workshops on the gas-works, for the purpose of presenting Mr. Hunter, on the occasion of his leaving their works as manager, with a suitable testimony of their respect. The rooms were tastefully decorated with evergreens, bannerets, and small devices. After dinner the principal business of the meeting took place. Mr. Potts, of the borough treasurer's offices, was unanimously voted to the chair. The presentation was made by Mr. Paterson, Mr. Hunter's successor (in the unavoidable absence of Mr. John Mills, who is the oldest workman on the works, having served over 52 years). The present consisted of a gold, keyless, three-quarter plate, centre seconds, English lever watch, extra jewelled, and chronometer balance, with set hands and stop-works; together with a neatly illuminated presentation book, containing the names of the persons on whose behalf the presents were made. Mr. Hunter responded in very suitable terms. The inscription on the watch and the illuminated address ran as under:—"Presented to Mr. Samuel Hunter, A.I.C.E., by the officials and *employés* of the Rochdale Corporation gas department, on the occasion of his appointment as engineer to the Salford Corporation Gas-Works.—Oct. 2, 1875." The meeting was afterwards addressed by Messrs. Smith, Bell, Collinge, Leach, Howard, and others, and musical selections diversified the proceedings.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

As a whole, there has been a very steady feeling apparent in the pig iron transactions which have been entered into during the past week; but, in spite of such evident steadiness, there is no increase of prices to be noted. The North Yorkshire agents appear inclined here and there to concede a point to buyers of large lots, their current figures for general makers brands being as under:—No. 1 foundry, 58s.; No. 2 foundry, 55s. 6d.; No. 3 foundry, 53s.; No. 4 foundry, 50s.; No. 4 forge, grey, 49s. 6d.; No. 5 forge, mottled, 49s; No. 6 forge, white, 48s.; refined metal, 70s.; Kentledge, 57s. 6d.; and cinder pig, 40s.; all on net cash terms.

In merchant iron there have been but few sales, and those only in respect of small lots, which were needed for immediate use. Other transactions partly entered into were held over until the quarterly meetings at Birmingham and Wolverhampton had been held, and have since been concluded. It was not expected that any reduction in the price of finished iron could by any possibility be made this quarter, seeing that the cost of fuel, material, and labour is still so high that, even at the current prices, profit is hardly a thing to be thought of. It was rather anticipated, indeed, that the Staffordshire ironmasters would declare an advance of 10s. per ton on best and medium irons, but that anticipation has not been realized.

At the local foundry establishments a tolerably large production of castings is maintained. At one or two works of this description a little additional activity is temporarily visible, owing to some pressing orders for urgently needed machine castings having been put in hand. The brassfounders are still very fully engaged, and their order-books afford promise already of a capital winter's work.

The operative plumbers of Sheffield have sent in demands asking for an additional 2s. per man per week, with a reduction of working hours, to take effect six months hence.

At the Sheffield Town Council meeting, on Wednesday last, a large number of proposed extensions of the gas companies mains were assented to, including one 1762 yards in length, from Wadsley, to supply the village of Oughtibridge.

The coal traffic is very considerably increasing both in Yorkshire and Derbyshire, the most marked improvement naturally being in the house coal departments. In one or two instances of this class prices have been advanced during the week by from 6d. to 1s. per ton. Coke of local production is still 18s.; slack engine fuel, 3s.; and gas coal, 8s. to 11s. per ton.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The usual quarterly meeting of the representatives of the iron and coal trades of this district was held in the Town Hall, Birmingham, on Thursday last, and was very numerously attended. Naturally enough, the all-absorbing topic of conversation was the probable action of the coalowners with respect to the demand of the colliers for an increase in the rate of wages, and it transpired that a deputation from the men had been appointed to wait upon the masters on that day, to urge them to declare such an advance in the price of coal as would yield the men the increased rate of pay they are now seeking; but, owing to some misunderstanding, it appears that no special meeting of the Coalowners Association had been called, and, therefore, no formal answer could be given; but the secretary to the association (Mr. Collis) informed the deputation that the subject of their desired interview had already been fully discussed, and that the masters had decided that it was not expedient to advance the price of coal in the present condition of the trade. It will be remembered that by the agreement entered into between the masters and the men in July, 1874, the miners bound themselves to a fixed scale of wages, varying with the market value of coal, so that, failing any alteration in the price of coal, the present demand of the men will, of course, be refused.

But the unsettled aspect of affairs is producing much uneasiness throughout the district, for though the coalowners meeting has, by the oversight referred to, been deferred for a time, yet the result is practically a foregone conclusion, the masters in the Dudley and Cannock Chase districts having already expressed their determination to make no alteration in prices at present; and fears are now entertained that the men will, in their exasperation, violate the contract of 1874, and turn out on strike.

The demand for coal has been somewhat stimulated by the change in the weather. Household qualities are now in brisk inquiry, and the railway companies, as is usual at this season, are taking large quantities; but fuel for manufacturing purposes is still only in moderate request, and any advance in that class of coal is clearly out of the question.

In the iron trade operations are of very restricted extent, but manufactured iron is steady, on the basis of £10 for marked bars. Common unmarked iron may be had on the basis of £7 15s. for bars. Sheets, hoops, and bars are in moderate demand, but prices are declared to be utterly unremunerative.

The usual quarterly contracts for pig iron were concluded, on the basis of £6 per ton for cold blast, £4 10s. for hot blast, £3 5s. for medium qualities, and £2 15s. for cinder; but it is estimated that the total quantity contracted for is far below the usual average, and altogether the prospects of business for the ensuing winter are not very encouraging.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

The coal trade of this district, in the better classes of fuel, is fairly active, and there is no increase in stocks, although the pits are not yet in all cases working up to their full production. In common class coals there is no improvement to report, and the small firms continue to push sales in the market. In the Manchester district the house coal trade, both as regards local consumers and deliveries by waggons and boats to the outside districts, is tolerably brisk, and stocks in some quarters show a slight decrease. Good furnace coal and burgy are in fair demand; and the chemical and salt trades are taking a fair quantity of engine fuel, but this is generally at low prices. In the West Lancashire districts the best and second qualities of coal are a trifle stiffer in price. Arley Mine coal at the pit mouth being now quoted at 12s. to 13s. and 13s. 6d. per ton, and Pemberton four-feet at 10s. to 11s. and 11s. 6d. per ton. There is some talk of an advance of 1s. per ton at the end of the month; but whether this can be generally maintained is doubtful. In other descriptions of coal there is no change to notice.

The shipping trade is a little better. There are rather more inquiries from consumers round the coast, and a fair export trade is being done; but still there is no marked activity, and supplies in the Liverpool market are plentiful. Colliery proprietors in the Skelmersdale and neighbouring districts which rely largely on the shipping trade show, however, a little more firmness, so far as prices are concerned.

A few more inquiries for gas coal from consumers who have not placed contracts are reported in the Wigan district, but in the Manchester market there is no material improvement to notice.

The coke trade continues very dull, and prices are weaker, both local makers and sellers of North country cokes in this district being anxious to secure orders at lower rates.

The iron market of this district has been weaker during the past week, and prices of Middlesbrough pig iron especially are going down now that the shipping season is coming to a close. No. 3 foundry, for prompt delivery in this district, has been offering at 60s. 9d. per ton, No. 4 foundry at 58s. 9d., and No. 4 forge at 57s. 9d. per ton; whilst for deliveries over a few months merchants are disposed to make concessions of fully 1s. per ton. Manufactured iron in this district is also easier in price. Ordinary bars are offered at from £7 19s. to £8 per ton delivered, and puddled bars at £5 9s. There is less firmness in rails, light sections being quoted at £8 2s. 6d. per ton, and heavy ditto at £7 15s. per ton delivered.

The works are no better off, and generally are only poorly supplied with orders.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.

(FROM OUR OWN CORRESPONDENT.)

The household and gas coal trades were tolerably active last week. The price for household would be from 14s. to 12s., according to quality, and for gas coals from 10s. to 8s., with the usual discounts. Shipping turns for best gas coals continue to be rather long. Except for the better qualities, there is no great demand for manufacturing coals, which are quoted at from 15s. to 16s. per chaldron. A meeting of the steam coalowners is expected this week, when it will be decided whether or not the quoted prices shall be maintained for steam. But a reduction is very probable, as the Northumberland trade is subjected to a good deal of competition from Wales, and it is kept extremely flat and dull in consequence. The pits are working well in the gas coal districts; but there is broken time in the manufacturing and steam coal collieries. A new seam of cannel coal has been discovered at a fresh sinking near Axwell Park. There are no strikes or disturbances in the Northern coal-field worth mentioning, and things are going on tolerably quietly between the masters and men.

A very bad business is doing in the iron trade of the North, especially the finished and manufacturing branches of it. A great deal of distress is manifesting itself amongst the workmen in Stockton and Middlesbrough, and now, when the rush of foreign shipments is a thing of the past, there is a prospect of a very poor winter.

The chemical trade of the Tyne and the North of England exhibits no improvement, as the following quotations upon 'Change on Saturday indicate:—Crystals of soda, £4 per ton, less 10 per cent. discount; best alkali, £2 7s. 6d., less 7½ per cent.; seconds, £2, less 3½ per cent.; bleaching powder, £7 10s., less 5 per cent.; bicarbonate of soda, £11, less 5 per cent. The general manufacturing trade of the district is likewise extremely quiet.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

At the annual meeting of the shareholders of the Callander Gaslight Company, held a few days ago, it was agreed to declare a dividend of 10 per cent. for the past year. It was also agreed to reduce the price of gas from 9s. 2d. to 8s. 4d. per 1000 cubic feet, from and after the 25th of November.

Mr. Treasurer Miller, one of the leading members of the Glasgow Corporation Gas Committee, has been speaking upon the gas question at the annual meeting of the municipal ward which he represents in the Town Council. He said that the Gas Committee had now got over their difficulties. The quality of the gas at present was the same as it had been ever since it came into the hands of the corporation. In their anxiety to supply as good gas as possible, the committee had made for the following winter purchases of a larger proportion of first-class coal than they ever had before; and, notwithstanding all the increase in wages and cost of material, the increase in the cost of manufacture was scarcely perceptible. During the time the gas supply was in the hands of the gas companies, the cost, exclusive of the coal, was 10d. per 1000 cubic feet; and under the corporation it was 11d.; and it was found that 1s. per 1000 feet was required to pay for annuities, interest, and sinking-fund. The waste of gas, however, was something enormous, being very little under 20 per cent. of the total quantity manufactured, and if that was sold at the ordinary price of 5s., it would come to about £80,000 a year. The speaker did not think they could save anything like the whole of that, but they might save the half of it. A great deal of waste arose from causes which must always exist, but still 10 per cent. might be saved. Then how was that to be managed? If they were able to go over the whole of the city and renew the pipes, that might cure the evil; but would Glasgow stand that? In some of the streets there were as many as six pipes, the larger number of them being in use. The gas manager had thought one cause of the leakage was in the service-pipes, and to remedy that the committee had begun in the east end to renew the whole of those pipes, and to lay them in pitch. Already the number of pipes relaid was 3144. The expense of that was very great; but if any material saving could be effected in the waste, it would be well laid out. In another part of his address, Treasurer Miller said that the gas Acts had cost £20,500. Of that sum nearly £15,000 was expended in obtaining the transfer to the corporation of the undertakings of the old gas companies in 1868-69, while nearly £2800 were expended in resisting the attempt made by the Partick and Hillhead Gas Company in 1872-73 to interfere with the rights which the city had bought and paid for. Another town councillor, seeking re-election, addressed his constituents last Thursday night on the same subject. Speaking of the work of the Gas Committee, he told the meeting that the citizens were now getting gas of a higher illuminating power than was supplied in any other city in the three kingdoms. (Parenthetically I would ask the attention of the Aberdeen gas authorities to that statement.)

Some business was done in the share market on Tuesday last in Glasgow; 9 per cent. gas annuities at 212½, which is £2 over the rate previously paid. On the same day an odd lot of Glasgow Water Annuities changed hands at 99½ against a former quotation of 98¼.

The difficulty experienced in Galashiels some time ago on account of the police force being called upon to extinguish the street-lamps, and their refusal to do so, which led to a breaking up of the force for a time, has now been definitively solved. The Hon. C. Carnegie, inspector-general over the police of Scotland, declined to certify that the police force of Galashiels was efficient for the year ending April, 1875. Representations were made to the Home Secretary on the subject by the Police Commissioners, setting forth that the duty of extinguishing the lamps had been imposed upon the police in ignorance of any existing rule to the contrary, and quoted the practice of the burgh of Hawick as a precedent. A few days ago a letter was received from the Home Secretary, stating that the representation of the commissioners had received due consideration, and that the Galashiels police force were held to be efficient, and the Government grant would be paid. The letter added, however, that this was a matter of grace on the part of the Government, and that the police must not be so employed in future if they are held efficient, and are to share in the grant. This may be a warning to the police authorities in other towns.

The cards lately sent out by the Police Commissioners of Forfar for a plebiscite on the water supply question have been returned. Of the 3201 cards issued, only 1870 were returned—"No water," 1488; "Water," 382; majority against water, 1106. The gentlemen who urged the Police Commissioners, and also the Board of Supervision, to move in the matter of introducing water, two or three weeks ago, advised all the ratepayers who entertained their views to abstain from voting, on the ground that a plebiscite was useless and uncalled for. Before leaving Forfar, it is worth while to mention that one of the town councillors has resigned his seat in the council from conscientious motives on the water question. He entered the council two years ago as an anti-water-supply candidate, but his views have become altered. He thinks a supply of water is an absolute necessity, and hence he resigns the trust into the hands of those who elected him to carry out their views.

A plebiscite has also just been made at Galashiels, on the question whether

water is to be brought in under the Public Health Act, or by private bill. The result is—for the latter, 456 votes; for the former, 163. Nearly 1300 schedules were returned blank, or were spoilt, and could not be taken into consideration.

The Edinburgh and District Water Trustees held a meeting on Thursday last, when it was arranged that a new site for the Edgelaw reservoir should be taken from Lord Rosebery, at a cost of £8000, excluding compensation for any damage done to the estate by the works. A result was also made to a committee to prepare and prosecute in Parliament a bill, taking powers for the formation of the new reservoir, a compensation reservoir at Rosebery, the preservation of logs on Glencorse and the other reservoirs, the deviation of the line of pipes, and other necessary purposes.

Stimulated by the fact that, during the past summer, they had many complaints regarding the scarcity of water in the town, the Bathgate Burgh Commissioners have resolved on taking measures for materially increasing the supply. Messrs. J. and A. Leslie, Edinburgh, have the survey of the hills around Bathgate in hand, so that, on the report being received, the commissioners may proceed to fix on a scheme.

With the view of enabling the Police Commissioners of Dunfermline to increase their water supply, the Water Committee, in company with Messrs. Leslie, engineers, have recently visited the river Devon, and its tributary streams, passing on, during the second day of their inspecting tour, to the Craigluscar.

The Motherwell Burgh Commissioners have instructed the burgh surveyor to prepare plans and specifications for the new works which they have resolved on carrying out in order to bring in a supply of water from the Coldstream.

It seems that the Dundee Water Commissioners have not yet arrived at the end of their troubles in connexion with the pipe contract, as it is now announced that the contractors, at a meeting held in Glasgow a few days ago, have resolved not to confirm the arrangement that was proposed and carried at the last meeting of the Water Commission, and incidentally referred to in my "Notes" last week.

Since my last report was despatched there has been a marked change in the Glasgow pig iron market. As low as 60s. 9d. cash was taken on Thursday, although on Friday forenoon, after official hours, 61s. 6d. cash was offered. In the early part of the week, Gartsherrie Nos. 1 and 3 were reduced in price 2s. 6d. and 1s. 6d. per ton respectively; Eglinton No. 1, 1s. 6d.; and No. 3, 1s.; Coltness brands, 2s.; and Dalmellington, 1s. Gartsherrie, Shotts, Coltness, Eglinton, and Langloan were all reduced on Friday; Gartsherrie No. 1 again 2s. 6d. per ton, and the others to a less amount.

During the last few days the coal market has been stimulated so far as house coal is concerned, the prices of which have become firmer. Dulness still continues in other descriptions.

Clacton-on-Sea Gas and Water Company.—A company has just been registered for the purpose of supplying this new watering-place on the Essex coast. The capital is £5000, in 1000 shares of £5 each.

Birmingham Water Supply.—Dr. Hill, the Medical Officer of Health for Birmingham, while stating that there was during September a considerable improvement in the quality of the water supplied to that town, reports that "the nitrogenous constituents still range high."

Drainage of Maidstone.—The drainage of Maidstone, at a cost of £30,000 has been decided upon. The plans are those of Mr. Angell, C.E., who will lay down 27 miles of pipes and conduct the sewage out of the town to a point where it will be filtered and subjected to the clarification by the lime process. The solid matter will be retained in tanks, and the effluent water, in its clarified state, discharged into the Medway.

Reductions in the Price of Gas.—The directors of the Ipswich Gaslight Company give notice that on and after the 1st of January next the price of gas to private consumers will be reduced from 4s. to 3s. 9d. per 1000 cubic feet. A further reduction of 3d. (from 3s. 9d. to 3s. 6d.) will take place at Swansea at the same time. The Halifax Corporation, at their meeting on Friday last, agreed to the recommendation of the Gas Committee to reduce the price of gas supplied within the borough from 4s. to 3s. 8d., and from 5s. 4d. to 5s. per 1000 feet supplied outside the borough.

The late Fatal Escape of Gas at Walsall.—Another death has resulted from the accident referred to in our last number. Mrs. Nicholls, wife of the man whose death was then reported, has since succumbed to the effects of inhaling gas. It will be remembered that the escape took place on the night of the 30th ult., through some holes in a pipe under the landing at the top of the stairs, occasioned by the nailing down of the boards, and the next day the deceased and her husband were found in bed in an unconscious state. Neither of them ever recovered consciousness, the husband dying two days afterwards, and his wife lingering until Wednesday morning, when she also expired. A verdict of "Accidental death" has been returned by the coroner's jury.

Discovery of Cannel Coal at Axwell Colliery.—We are given to understand that a seam of cannel coal has been proved at this colliery within the last month. From the analyses made by Mr. John Pattinson, analytical chemist to the Newcastle-upon-Tyne Town Council, it appears that this coal possesses an illuminating power of 26 standard sperm candles, and the coal being subjected to distillation in a coal-testing apparatus, was found to contain 10,000 cubic feet of gas. The quality of the coke is quite satisfactory. This colliery has been opened out only for the last 12 months, and coal is being produced from two seams, the quality of which is excellent, and well adapted for gas and coking purposes. The owners of the colliery are Messrs. R. S. Bagnall and Sons, Winlaton. The fitters for the colliery are Messrs. H. W. Dodd and Co., Quayside, Newcastle-upon-Tyne.—*Newcastle Daily Chronicle.*

Newport (Isle of Wight) Water Supply.—At the meeting of the Newport Town Council on Tuesday last, the town-clerk read a letter from Mr. Ball, secretary to the Newport Carisbrooke Water Company, stating that the Confirmation Bill in relation to their Provisional Order had received the Royal Assent, and had now become law. That being so, the company wished to ascertain whether the local board desired to purchase the works and all the rights and interests therein, which the company offered for the sum of £8500. The present annual income from the rates might be fairly taken at £500 per year; this might be increased by the new powers to £650; and with the new works £800 or £1000 a year might be realized. On receipt of this letter the town-clerk, instructed by the committee, wrote for further particulars as to the property, but it appeared that the company hesitated to supply these until they knew whether there was a disposition on the part of the local board to purchase. After some discussion, it was resolved—"That in the absence of particulars this board is unable to entertain the offer of the company."

Chelmsford Public Lighting.—At the meeting of the Chelmsford Board of Health on the 24th ult., the Lighting Committee reported that they had received a letter from Mr. Mead, the secretary to the Chelmsford Gas Company, stating that in consequence of the bad condition of the taps and burners fitted to the public lamps, it would be necessary for the board to provide new ones immediately, and suggesting that in lieu of the present taps and burners, each lamp should be provided with a regulating governor, at a total cost for the district of about £37 10s. The cost of new taps and burners, if renewed, would be about £20. The committee had had three lamps tested by the new regulating governors, and had ascertained that a lamp upon which one was fixed, and which consumed 4½ cubic feet of gas per hour, gave a better light than one of the existing lamps in its present state. The board were now paying under their contract upon an estimated consumption of 5 cubic feet per hour, and if the regulating governors were applied to all the public lamps, the committee were of opinion that this plan would effect a saving of one-tenth in the consumption, or about £45 per annum, and this sum would be allowed off the contract price by the gas company. The saving of gas to the gas company would also be considerable. The committee, therefore, recommended that the system be adopted throughout the district, provided the gas company would consent to pay one-half of the expense of providing the lamps with new regulators. After a brief conversation, the report was adopted. The directors of the gas company have accepted the terms of the recommendation, and the lamps are to be fitted with Sugg's governors.

Recent Gas Explosions.—On Wednesday, Sept. 29, shortly after seven o'clock in the evening, an explosion took place at Brighton. The gas from a pipe supplying the window-lamps of the premises of Mr. Bond, hosier, of No. 77, North Street, had escaped, and had accumulated in a space over the shop-front. It became ignited in some way from coming into contact with the flame of the outside lamps. Mr. Bond's premises adjoin those of Mr. Eyles, printer and publisher, and a large and heavy facia board, running along the length of the double house, was blown out with a crash, a large amount of damage being done. Fragments of the building were sent completely across the roadway, which is of a considerable width at this point, and the opposite property suffered. The plate glass in some of the adjoining windows was smashed, and a lady who was going by at the time was knocked down, and sustained severe injuries to the head and other parts of the body. Fortunately the premises did not take fire. On the morning of Friday, Oct. 8, an explosion occurred in the offices of the Glendon Iron Company, Belvoir Street, Leicester, which did considerable damage, severely injured one party, and slightly another. It appears that, between seven and eight o'clock, Ex-Sergeant Tansley and his wife, who live on the premises, perceived a strong smell of gas, evidently coming from the offices below. They went downstairs to ascertain where the leakage was, the former having a lighted candle in his hand. They went into the back office, and, just as they entered, there was an explosion which shook the building, tore the office-door and broke the railing opposite, smashed a wood and glass partition some distance off in the passage, and severely burned Mr. Tansley's face, while his wife also received some slight injuries.

Hull Water Supply.—At the meeting of the Hull Water-Works Committee on the 4th inst., the engineer (Mr. D. Maxwell) reported that the total 14 days supply was 66,957,000 gallons; average daily, 4,782,643 gallons. Coal consumed 91 tons 6 cwts.; coal per million gallons, 27·27 cwt., cost 19s. For the water-works year ending the 29th of September, the supply of water to the town had been 1659 million gallons; or an average of 4,545,000 gallons; about 34 gallons per day to every one of the population. The year's supply had been 26 million gallons, or half a million gallons weekly under the average supply for the years 1871-2-3. As since that period there was an undoubted increase in the legitimate use of water, as evidenced by increased water-rents, they must conclude that very much less waste than formerly was now going on. The bores were at present yielding no more than sufficient water to maintain constant supply to the town. He thought there was no doubt but that less water than in former years was flowing through the strata at the given depth. Hence they were obliged to pump without cessation, and keep the wells as low as possible, depending on the Sunday's gain to make up the weekly loss in the reservoirs. He was in hopes that the new bores now in progress would bring them considerably more water, and so make the supply safer, give some time for repairs, and, by pumping from a less depth, lessen the charge for coal. Spread over their works, as the bores would be, the full value of Springhead as the only source of supply would be fairly tested. The town supply was at present 5 million gallons per week above what it was at the corresponding season last year, and he expected that they would be able to fully maintain a constant supply. The warm weather being over, it was now the best time for employing the reservoirs, and he proposed that they should be taken in turn forthwith.

Oxford Gas and Water-Works.—The *Oxford Chronicle*, speaking of the improvements and alterations in the town during the last 12 months, says the gas-works are being enlarged to meet the increasing demands of the public. A large gasholder, 95 feet in diameter and 30 feet deep, is being erected on a portion of the Friars Wharf. The tank is nearly completed, and the gasholder is being made at the iron-works in Staffordshire. A new main is being laid to the military depôt at Bullingdon, for the purpose of lighting the barracks with gas. Gas-mains have also been extended to Osney, and some distance in the north of Oxford. Several new retorts will shortly be erected at the gas-works, in order to give more power for generating gas. The management of the water-works having been recently transferred from the trustees to the corporation, steps were taken early in the present year for the purpose of securing a better supply both as regards the quantity and the quality of the water. The works are now managed by a committee appointed annually by the Town Council, and one of the first acts of the new committee was to apply to Parliament for the necessary powers to extend the works. This measure, which became law in the last session, empowers the corporation to erect a reservoir on Headington Hill, and to extend the water supply to some of the adjoining villages. The Water-Works Committee is actively engaged in making the necessary arrangements for the construction of the reservoir on Headington Hill, and when completed the city will possess a continuous supply of water both night and day. We may add that the water in the railway lake has been recently analyzed by Dr. Letheby, the eminent chemist, who has expressed a highly favourable opinion of its quality, and it is confidently anticipated that when the contemplated works are completed the water supply in Oxford will be equal to the most favoured locality in the kingdom. During the past year mains have been laid in some of the new streets in Cowley and St. Clement's, as well as in Winchester, Leckfort, and Canterbury Roads, St. Giles's.

Proposed Extension of the Halifax Corporation Gas-Works.—At the meeting of the Halifax Town Council, on the 6th inst.—the Mayor (Alderman Crossley) presiding—the minutes of the Gas-Works Committee were presented. They embraced the report of a committee appointed to inquire into the probable extensions at the gas-works during the next ten years. The report stated that the quantity of gas made in 1864 was 140,566,000 cubic feet, and in 1874 the quantity was 246,912,000 cubic feet, being an average yearly increase of 5·87 per cent. The average per centage of 1874 over 1864 was 75·65. Assuming the make to increase in the same ratio during the next ten years, there will be a yearly make in 1884 of 433,700,000 feet. The heaviest consumption in one day in 1864 was 689,000 cubic feet; in 1874 it was 1,592,000, or an increase of 131·06 per cent., which, if added to the latter, would give a heaviest day's consumption in 1884 of 3,677,000 cubic feet. The committee considered that the cost of the extensions that would be required would amount to £93,450, made up of the following items:—Tank and gasholder, £25,000; retorts and house, £30,000; purifying-house and purifiers, £15,000; condensers and fixings, £2000; scrubbers, &c., £3000; station-meter and governors, £1500; extension of mains, £15,000; 30 new railway waggons, £1950. On reviewing the whole case, the committee were of opinion that the power to borrow, in the new Act of Parliament about to be applied for, should be not less than £100,000. The estimate of the committee for 1876 was—expenditure, £62,442 13s.; income, £57,014 3s. 10d. The committee recommended the council to reduce the price of gas supplied within the borough from 4s. to 3s. 8d. per 1000 feet, and from 5s. 4d. to 5s. per 1000 feet for gas supplied outside the borough. After some discussion, the minutes were approved, with the exception of the recommendations of the committee as to the borrowing of £100,000, and the reduction in the price of gas, which were reserved for further consideration. A letter from Alderman Berry, chairman of the Corporation Gas Committee, was read,

resigning his office as an alderman of the borough. The Town Council, at their meeting on Friday last, agreed to the recommendation of the Gas Committee in regard to the reduction of the price of gas.

ALLEGED NUISANCE AT THE DOVER GAS-WORKS—ABANDONMENT OF PROPOSED LEGAL PROCEEDINGS.—At the weekly meeting of the managing committee of the Town Council, on the 7th inst.—the mayor (Mr. Pierce) presiding, the town-clerk read the following letter from the secretary of the Dover Gaslight Company:—

Dover, Oct. 1, 1875.

Dear Sir,—I have laid before the directors of the Dover Gaslight Company your letter of the 28th of September stating that the Town Council continued to receive complaints of the nuisance from the Buckland works, and that the council are informed by their medical and sanitary officers that the company have not yet carried out such alterations as are calculated to reduce the nuisance to a minimum, and that on a recent visit they did not see any works in progress for effecting that object. So far from having done nothing to remove any grounds of complaint against the works, the directors in the month of March last gave orders for the construction of additional plant, involving an expenditure of £700, which their consulting engineer advised them would be ample to enable the works to be carried on in accordance with Dr. Robinson's suggestions and without annoyance to the public. The works, from their nature, took some time in construction, but they have now been completed, which probably was the reason why the officers of the council did not see anything in progress. The directors are informed that the fact of a portion of their purifying apparatus being unavoidably out of action during the last month (while the new plant was being fixed) was probably the cause of the recent complaints, which the directors have every reason to hope, now the whole system is once more in action, will not occur again. But beyond this (and contrary to the opinion of their engineer that further plant is unnecessary) they have now ordered, at a very large expense, the construction of two additional purifiers, which will be erected with all possible speed, and which will undoubtedly enable Dr. Robinson's suggestions to be carried out to their fullest extent. But should the Town Council or their medical officer have any doubts that the company are doing all they can to carry on their works in the best possible manner to reduce annoyance from them to a minimum, or should they think that the plant with the proposed additions will be capable of still further improvement, the directors instruct me to say that they are willing that a leading gas engineer, to be mutually agreed upon, should inspect the works, or that their consulting engineer should meet Dr. Robinson, and to pledge themselves to carry out any reasonable suggestions that may be made upon the subject. (Signed) G. FIELDING.

W. Knocker, Esq., Town-Clerk.

The mayor stated that on receipt of the letter he had taken upon himself to stop the proceedings which had been ordered to be taken against the company. There was a general concurrence of opinion in the committee that the communication was highly satisfactory, and after some conversation Mr. Peake gave notice (a point of order having been raised) that he would move at the next meeting that the order made at the last meeting for a summons to be taken out against the gas company be rescinded.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

3477.—ARROWSMITH, J. J., and FERGUSON, H., Liverpool, "Improvements in plugs or stoppers for tubes." Oct. 7, 1875.

3486.—CLARK, A. M., Chancery Lane, London, "Improvements in coating or covering metals for preventing their oxidation or corrosion." A communication. Oct. 7, 1875.

3490.—LAKIN, J. P., Birmingham, "An improved dry slide for gas-fittings." Oct. 8, 1875.

3516.—JOHNSON, J. H., Lincoln's Inn Fields, London, "Improvements in means of and apparatus for condensing steam or other vapour, parts of which improvements are also applicable to other similar purposes." A communication. Oct. 9, 1875.

3526.—CLARK, A. M., Chancery Lane, London, "Improved automatic gas lighting and extinguishing apparatus." A communication. Oct. 11, 1875.

3539.—LEONARD, W. A., Holborn Viaduct, London, "Improvements in continuous ignition fuses and in the friction match composition employed therewith, which composition is applicable to friction matches generally; also in apparatus or means for propelling and igniting the said fuses, applicable to the lighting of lamps and gas-burners of all kinds, cigar lighters, torches, and other purposes of ignition." Oct. 12, 1875.

3541.—MELVIN, T., Glasgow, "Improvements in engines to be driven by steam, water, or other fluid, or for pumping." Oct. 12, 1875.

3542.—NEWTON, H. R., Seymour Street, London, "A locking apparatus for regulating a constant measured small or large supply of filtered or unfiltered water, to be delivered into existing cisterns or other reservoirs, or by a new system into closed tanks." Oct. 12, 1875.

3564.—DURHAM, W., Currie, Midlothian, N.B., "Improvements in purifying water." Oct. 14, 1875.

GRANTS OF PROVISIONAL PROTECTION.

3013.—HORNSBY, W. H., Portland Place, London, "An improved compound material for packing for valves." Aug. 27, 1875.

3411.—BOURRY, E. A., St. Gallen, Switzerland, "Improvements in joining or connecting pipes to each other, or to plane or curved surfaces." Oct. 1, 1875.

NOTICES TO PROCEED.

1672.—WHITLEY, J., Leeds, "Improved mode of and arrangements for removing from sewers and dealing with deleterious gases." May 5, 1875.

2026.—BLAKE, J. W., Jersey, U.S.A., "Improvements in steam-pumps." A communication. June 2, 1875.

2030.—DYKES, W., and SCOTT, J., Glasgow, "Improvements in taps or valves for controlling the flow of liquids or fluids." June 2, 1875.

2095.—MURDOCH, H. H., Staple Inn, London, "Improvements in the joints of pipes or tubes." A communication. June 7, 1875.

2358.—ODAMS, J., Fenchurch Street, London, and BLACKBURN, R., Exeter, "Improvements in apparatus for treating sewage." June 29, 1875.

2401.—BANNER, E. G., Billiter Square, London, "Improvements in house traps for preventing the passage of sewer gas into dwellings from sewers, drains, or cesspools." July 2, 1875.

2856.—BUTLER, G., Southwark, London, "Improvements in ball valves for high or low pressure water service, and for drawing off other liquids." Aug. 13, 1875.

3137.—YOUNG, W., Clippens, Renfrew, "Improvements in obtaining hydrocarbon vapours from gases, and in the apparatus employed therefor." Sept. 7, 1875.

3205.—SPENCER, W. H., Brooklyn, New York, "Improvements in the manufacture of illuminating gas." Sept. 13, 1875.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

1397.—MURDOCH, H. H., Staple Inn, London, "Improvements in treating and utilizing spent tan and obtaining useful products therefrom." A communication. April 16, 1875.

1401.—WEST, W., Kentish Town, London, "Improvements in compressing, storing, and utilizing air, and other fluids, and in apparatus therefor." April 17, 1875.

1567.—PAYTON, W., Shelgate Road, Surrey, and HOLMES, J. E., Newton Terrace, London, "Improvements in engines to be actuated by steam, air, or other fluid, also applicable for raising and forcing liquids." April 29, 1875.

1599.—JENNINGS, J. G., Lambeth, and POCOCK, A. W., Westminster, London, "Improvements in liquid-meters." April 30, 1875.

1752.—HALLSWORTH, S., and BAILES, R., Leeds, "Improvements in purifying illuminating coal gas and in the preparation of the means employed therefor." May 11, 1875.

1865.—MORGAN-BROWN, W., Southampton Buildings, London, "Improvements in photometers." A communication. May 21, 1875.

2017.—CREASE, J. F., Southampton, "Improvements in the construction of filters." June 2, 1875.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION has been AWARDED to

GWYNNE & BEALE'S PATENT IMPROVED GAS-EXHAUSTERS,

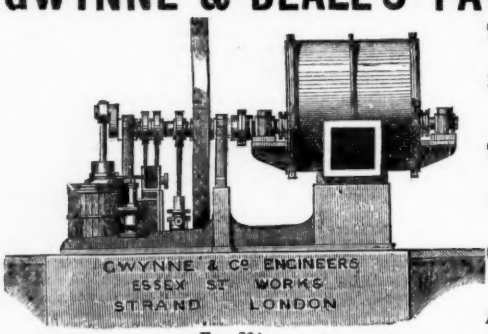


FIG. 224.

The BEST EXHAUSTERS IN THE WORLD.

Made under the personal superintendence of

Mr. BEALE,

The oldest Maker, Inventor and Patentee of

GAS-EXHAUSTING MACHINERY.

(It is NOT CORRECT to state that Mr. BEALE has RETIRED.)

Prices and every information on application.

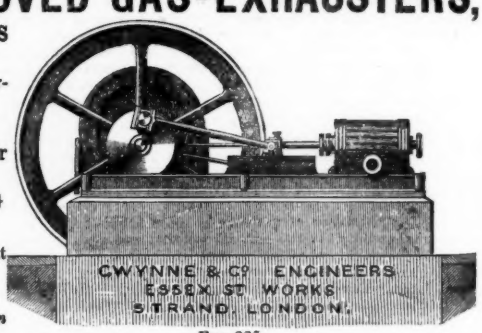


FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND CO. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

REGULATORS, BYE-PASSES, STOP-VALVES, GAS-VALVES, & MACHINERY FOR GAS MANUFACTURE, OF ALL SIZES,

CAN BE HAD ON APPLICATION TO

GWYNNE & CO., HYDRAULIC & GAS ENGINEERS, ESSEX STREET WORKS, STRAND, LONDON, W.C.

G. & Co. are now manufacturing for a London Gas Company three of their 210,000 *cubic feet Patent Gas Exhausters, and many of all sizes.*

D. BRUCE PEEBLES & CO.,

ENGINEERS,

FOUNTAINBRIDGE WORKS, EDINBURGH,

MANUFACTURERS OF WET AND DRY GAS-METERS;

Patentees and Sole Manufacturers of PEEBLES' LAMP-GOVERNORS,

ABOVE 30,000 OF WHICH ARE NOW IN USE.

"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S., F.C.S.*

D. BRUCE PEEBLES AND CO., FOUNTAINBRIDGE WORKS, EDINBURGH.

WANTED, to Lease a small Gas-Work. The highest reference can be given.
Address No. 212, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, a steady Man as Stoker, &c., for a small country Gas-Work during the next four months. Wages 22s. per week.
Apply to G. S. FURNIVALE, Bradley Green, near CONGLETON.

WANTED, a situation as Manager of a small Gas-Work. Understands main and service laying, meter and gas fitting, internal fitting and retort-setting. Twelve years testimonials.
Address No. 213, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, the Management or Assistant Management of a Gas-Work. Five years practical experience in the manufacture and distribution of gas.
Address No. 214, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a thoroughly practical Man, a situation as METER INSPECTOR, or Meter Inspector and Gas-Fitter, &c. Has had 11 years experience. Good testimonials.
Address W. A. HEWLETT, 3, Francis Street, Paddington, LONDON, W.

WANTED, a Stoker for a small work. One who understands an engine preferred. Wages 23s. per week.
Apply, by letter only, with references or testimonials, to No. 210, care of Mr. King, 11, Bolt Court, Fleet Street, LONDON, E.C.

WANTED, by the Ilkeston Gas Company, two or three good STOKERS. Wages 25s. per week. Sundays paid for in addition, if occasion to work. None need apply unless they have been used to the work.
Application to be made to the works.
Ilkeston, near Nottingham, Oct. 9, 1875.

WANTED, by the Rugby Gas Company, a good steady Man as MAIN and SERVICE LAYER. Able to fix and take the indices of meters, and do the necessary repairs upon the works. One accustomed to an engine and exhauster preferred. Wages 23s. per week, with house, fire, and gas found.
Applications, with references, to be sent to the MANAGER.

WANTED, in a Gas-Work, where the annual make is about 14 millions, a Leading STOKER, who has been accustomed to the use of clay retorts, engine, and exhauster.
Apply, by letter, stating wages required, and enclosing references, to Mr. JOHN BUDDEN, Manager, Poole Gas-Works, DORSETSHIRE.

WANTED, a new or second-hand STANDARD PHOTOMETER, with all its appliances complete.
JET PHOTOMETER.
GAS INSPECTOR'S POCKET CASE.
Apply, with price, to Messrs. WILLIAM BLEWS AND SONS, Gas Engineers, BIRMINGHAM.

LUTTERWORTH GASLIGHT AND COKE COMPANY.

WANTED, at the end of the present month, by the Directors of the above Company, a steady, trustworthy, married Man as STOKER, who is competent to undertake the practical management of the works.
Applications, stating age, wages required, and enclosing testimonials, to be addressed to the SECRETARY.
N.B.—A good house and garden, with fire and light free.

TO GAS COMPANIES AND GAS ENGINEERS.

WANTED, by a Gentleman, a situation as ASSISTANT ENGINEER or Draughtsman, either in a Gas-Works or Gas Engineering Works. Thoroughly conversant with all the details, having had much experience in designing, superintending the construction and erection of new Gas-Works, Apparatus, &c.; also extensions and alterations of the same. Is a good draughtsman. Can prepare working drawings, quantities, &c. Over 14 years experience with an extensive Gas Engineering Firm. First-class references or testimonials.
Address G. E., care of Mr. W. W. Thomas, 7, Westminster Chambers, Victoria Street, WESTMINSTER, S.W.

JOHN HALL AND CO., STOURBRIDGE,

Manufacturers of FIRE-BRICKS, LUMPS, TILES,

AND EVERY DESCRIPTION OF FIRE-CLAY GOODS.

N.B.—A Stock of 15 and 16 in. CIRCULAR RETORTS always on hand. Other kinds made to order on short Notice.

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PHŒNIX FIRE-BRICK WHARF,

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GAS ENGINEER AND CONTRACTOR FOR THE ERECTION OF GAS-WORKS,
AND FOR THE
SUPPLY OF RETORTS, FIRE-BRICKS, CAST-IRON MAINS,
AND ALL MATERIALS FOR GAS MANUFACTURE AND DISTRIBUTION.

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DIBDALE FIRE-CLAY, BRICK, AND GAS-RETORT WORKS,

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A LARGE QUANTITY OF RETORTS ALWAYS IN STOCK.

Circular .	14 in.,	15 in.,	16 in., 18 in.
Ovals . .	17 in. × 14 in.,	17 in. × 15 in.,	20 in. × 15 in., 21 in. × 15 in., &c.
D's. . .	14 in. × 14 in.,	15 in. × 12 in.,	15 in. × 13 in., 17 in. × 14 in., 18 in. × 13 in.
	18 in. × 15 in.,	20 in. × 16 in.,	22 in. × 14 in., 24 in. × 14 in., 24 in. × 15 in., &c.

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By THOMAS NEWBIGGING, A.I.C.E.

The scope of this work is apparent from its title. The First Edition, published a year or two ago, was eagerly sought for, and has been now for some time out of print. The favourable reception accorded to it sufficiently proved that it supplied a generally acknowledged want in the profession. The work has undergone careful revision; much new matter has been added; and the New Edition is published in foap. 8vo., morocco, gilt.

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SOUTH METROPOLITAN GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that an EXTRAORDINARY GENERAL MEETING of this Company will be held at the London Tavern, Bishopsgate Street, in the City of London, on MONDAY, the 1st day of November next, at Two o'clock in the afternoon precisely, to consider the Metropolitan Gas Bill, which passed Committee in the House of Commons in the last Session of Parliament, and whether the Directors should be recommended to oppose the Bill or otherwise, on its reintroduction in the next Session of Parliament.

N.B.—Proxies must be sent to the Secretary not later than the 29th inst.

By order of the Board,
GEORGE LIVESEY, Secretary and Engineer.
589, Old Kent Road, S.E., Oct. 11, 1875.

NEW EDITION, NOW READY,

ADVANTAGES OF GAS FOR

COOKING AND HEATING.

By MAGNUS OHREN, A.I.C.E., F.C.S.

For Companies to issue to their Gas Consumers.

Specimen Copy by post Threepence, direct from MAGNUS OHREN, Gas-Works Lower Sydenham, London, S.E.

THE Advertiser, who will shortly be disengaged, requires an engagement as MANAGER of a Gas-Work making about 10 millions yearly. Practical knowledge of the business in all its branches.
Good testimonials as to ability and personal character on application to W. D. CHILD, 71, Driffield Road, NORTH Bow.

WANTED, GAS-WORKS TO LEASE.

THE Engineer of a Work of acknowledged repute is desirous of LEASING a small work. Can offer unusual advantages to companies or proprietors whose undertakings are unremunerative, or have fallen into a dilapidated condition.
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A Small Condenser for Sale, 5 ft. long, 14 in. wide, 16 in. deep; six 3-in. pipes, &c. Suitable for a small work.
Apply to E. HIORNS, Secretary, Gas Office, Woodstock, OXON.

STATION-METER, second-hand, for SALE, in good condition. Capable of passing 5000 feet per hour, together with bye-pass, valves, and connexions complete. To be sold to make room for a larger one.
Apply to Mr. C. TURNER, Manager, Gas-Works, Ravensthorpe, MIRFIELD.

STATION-METER for Sale, in good condition (Makers West and Gregson) in very ornamental case, fitted up with tell-tales, inlet, outlet, and bye-pass valves, and 12-in. connexions. Passes 25,000 cubic feet per hour. Now replaced with a larger one.
For price, &c., apply to JOHN W. WHITAKER, Manager, Gas-Works, WAKEFIELD.

VALUABLE COLLIERIES FOR SALE.

TO BE SOLD by Public Auction (unless previously disposed of by private contract), on Saturday, October 23, at Three o'clock in the afternoon, at the Queen's Head Hotel, Pilgrim Street, Newcastle-upon Tyne, by Mr. William Easton, Auctioneer, all those Valuable COLLIERIES, known as the Findon Hill and White House Collieries, containing 460 acres, or thereabout, of Freehold and Leasehold Royalties, with a complete Plant, Machinery, &c., all in good working order; also a large number of Freehold and Leasehold Cottages situate near thereto.
For further particulars, and orders to view, apply to GEORGE THOMPSON, 1, Newgate Street; RICHARD ORMOND, 18, Grainger Street West; Messrs. KENELYSIDE AND FORSTER, Solicitors; Messrs. INGLEDEW AND DAGGETT, Solicitors, all of NEWCASTLE-UPON-TYNE; or to Messrs. WILKINS AND BLYTH, Solicitors, 10, St. Swithin's Lane, LONDON.

TO GASHOLDER MAKERS.

THE Rossendale Union Gas Company are prepared to receive TENDERS for the erection of a 150 ft. GASHOLDER, single-lift, 30 ft. high, with columns, girders, &c., at their works, Clough Fold, near Manchester.
Plans and specifications for the same may be seen at the Company's Office, Clough Fold, on and after Friday, the 22nd inst.
Sealed tenders to be addressed to the Chairman of the Company, on or before the 3rd day of November next.
WM. BLACKLEDGE, Manager.
Oct. 15, 1875.

THETFORD WATER-WORKS.

TO CONTRACTORS.

THE Town Council of the Borough of Thetford, in the counties of Norfolk and Suffolk, desire to receive TENDERS for the following Contracts:—
CONTRACT No. 1.—For the sinking and boring of an Artesian Well.
CONTRACT No. 2.—For the construction and erection of a Brick Reservoir, Manager's Cottage, Engine, Boiler, and Coal Store House, with Chimney Shaft, Boundary Wall and Entrance Gates.
CONTRACT No. 3.—For the supply and erection of Steam-Engine, Boiler, and Pumps.
CONTRACT No. 4.—For the providing and laying of Cast-Iron Water-Mains, Connexions, Hydrants, Bends, Valves, &c., &c.
The respective drawings and specifications can be seen, and quantities and forms of tender can be obtained, at the Offices of Messrs. Jabez Church and Son, 17B, Great George Street, Westminster, Civil Engineers. Copies of the drawings and specifications can also be seen at my Office.
Tenders sealed, and endorsed "Tender for Thetford Water-Works," must be delivered here on or before the 1st day of November next.
The Council do not bind themselves to accept the lowest or any tender.
By order,
JOHN HOUCHEN, Town-Clerk.
Town-Clerk's Office, Thetford, Oct. 12, 1875.

WIDNES GAS-WORKS.

THE Widnes Local Board are prepared to receive TENDERS for the supply of about 341 tons of 18-in., and 61 tons of 16-in. SOCKET-PIPES, 12-ft. lengths, with other special castings.

Specifications may be seen at the Engineer's Office, Gas-Works, Widnes.

Tenders, endorsed "Gas-Pipes," and addressed to the Chairman of the Gas and Water Committee, to be delivered at the above works not later than Ten a.m. upon the 30th instant.

The Board do not bind themselves to accept the lowest or any tender.

HENRY ROBERTS.

Public Offices, Widnes, Oct. 5, 1875.

MR. HODGSON JONES, Memb. Inst. Civil Engineers of London and of Paris, has REMOVED his Offices to 26, Great George Street, London, S.W., where he may be consulted on all questions relating to Gas and Water Works, Drainage, Sanitary Works and Estate Improvements.

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CONSULTING GAS ENGINEER,

ECCLES, MANCHESTER.

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CONSULTING GAS ENGINEER,

BROOKLYN, CHEETHAM HILL ROAD,

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Twenty-three years at the Rochdale Road Works.

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48, GORDON STREET (late 135, BUCHANAN ST.),

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Supplies every requisite in connexion with the distribution of Gas and Water.

Estimates and prices on application.

WOOD GRIDS for Purifiers and Scrubbers.

Cast-Iron PIPES and VALVES.

Street LAMP-PILLARS.

Patent Pipe SCREWING-MACHINES, &c.

Mr. ALFRED LASS,

60, CORNHILL, LONDON, E.C.,

Is prepared to open the Books, and, if necessary, keep the Accounts of Gas and Water Companies.

To examine the Books and Accounts, and prepare Balance-Sheets for the information of Directors.

To assist Secretaries in preparing Balance-Sheets, according to the "Gas-Works Clauses Act, 1871;" or may be consulted with respect to Accounts generally.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

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THOMAS ALLAN & SONS, of Springbank Iron-Works, Glasgow, manufacture small cast-iron GAS AND WATER PIPES, ½ to 6 inches, at their branch works, Stockton-on-Tees, and have at present large stock, which they are open to sell at moderate prices

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G. A. BAILEY AND CO., Machinists, Manufacturers of all kinds of Indexes for Gas and Water Meters, Indicators, Tell-Tales for Turnstiles, on an improved principle. Every description of Wheel and Worm Cutting, &c.

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WATER-MAINS.

COTTERILL'S PATENT STEEL TUBE- DRILLS, for connecting services to water-mains, *under pressure*, without turning off the water. They drill and tap themselves, and are left in the mains. Made of all sizes, from ¾ to 2 inches and upwards. They cost less than the ordinary plan.

Apply to CHARLES FORSTER COTTERILL, Cannock, STAFFORD, Patentee.

IN THE MATTER OF BRONNER'S PATENT BURNERS.

NOTICE is Hereby Given that Julius Brönner, on the 20th of April, 1875, in a suit in Chancery, 1874, B 365, obtained an injunction perpetually restraining the Defendant, his Agents, Servants, and Workmen, from in any way advertising or offering for sale, or selling, or from in any manner causing to be advertised, or offered for sale, or sold as "Real Brönner," or "Brönner," or "Broehner" Burners, any Burner not manufactured by or for the Plaintiff, Julius Brönner, or by his Agents.

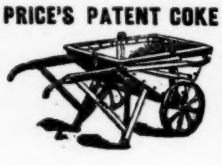
JACKSON, FOX, AND ELLEN,

55, Chancery Lane, London,

Solicitors for the Plaintiff,

JULIUS BRÖNNER, Frankfort-on-Maine.

PRICE'S PATENT COKE & COAL BARROW



effecting a great saving of time, labour, and expense.

For particulars, price, &c., apply to MR. E. PRICE, Inventor and Patentee, Gas-Works, Hampton Wick, MIDDLESEX.

MESSRS. JOHN BETHELL & CO.,

(ESTABLISHED 1836,)

CONTRACTORS for GAS TAR,

MAKERS OF ANTHRACENE, CREOSOTE, &c.,

CLAYTON CHEMICAL WORKS, MANCHESTER;

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Head Offices: 38, KING WILLIAM STREET, LONDON BRIDGE.

CLYDE TUBE WORKS, GLASGOW & COATBRIDGE.

OFFICES, 41, OSWALD STREET, GLASGOW,

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GUN METAL & OTHER COCKS, ALL KINDS OF IRON & BRASS FITTINGS

For GAS, WATER, and STEAM;

CAST-IRON PIPES, CORE BARS for IRONFOUNDERS,

STOCKS, DIES, and TAPS, GAS PLIERS and TONGS, &c., &c.,

ALWAYS KEPT IN STOCK.

LAP-WELDED IRON BOILER TUBES,

As supplied to the English, French, and Dutch Admiralties, and principal Railways and Engineers at Home and Abroad.

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NEWGATE STREET, LONDON.

Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

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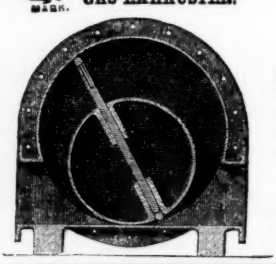

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GAS EXHAUSTERS

ARE NOW MANUFACTURED BY

B. DONKIN & CO.

MR. J. BEALE, of East Greenwich, having retired from business, has made an arrangement with B. DONKIN & CO. for the sole manufacture of his Patent Solid-Slide Gas Exhausters.

B. D. & Co. also make Steam-Engines to drive Gas Exhausters direct or otherwise, and Gas-Valves.

Estimates and Prices on application to

B. DONKIN & CO.,

ENGINEERS & IRONFOUNDERS,

BERMONDSEY, LONDON, S.E.

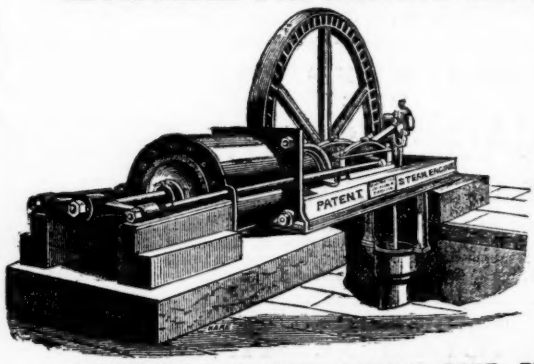
ECONOMY OF FUEL IN STEAM-ENGINES.

B. DONKIN & CO.,

PATENT HORIZONTAL COMPOUND CONDENSING

STEAM-ENGINES,

APPLICABLE FOR DRIVING GAS-EXHAUSTERS.

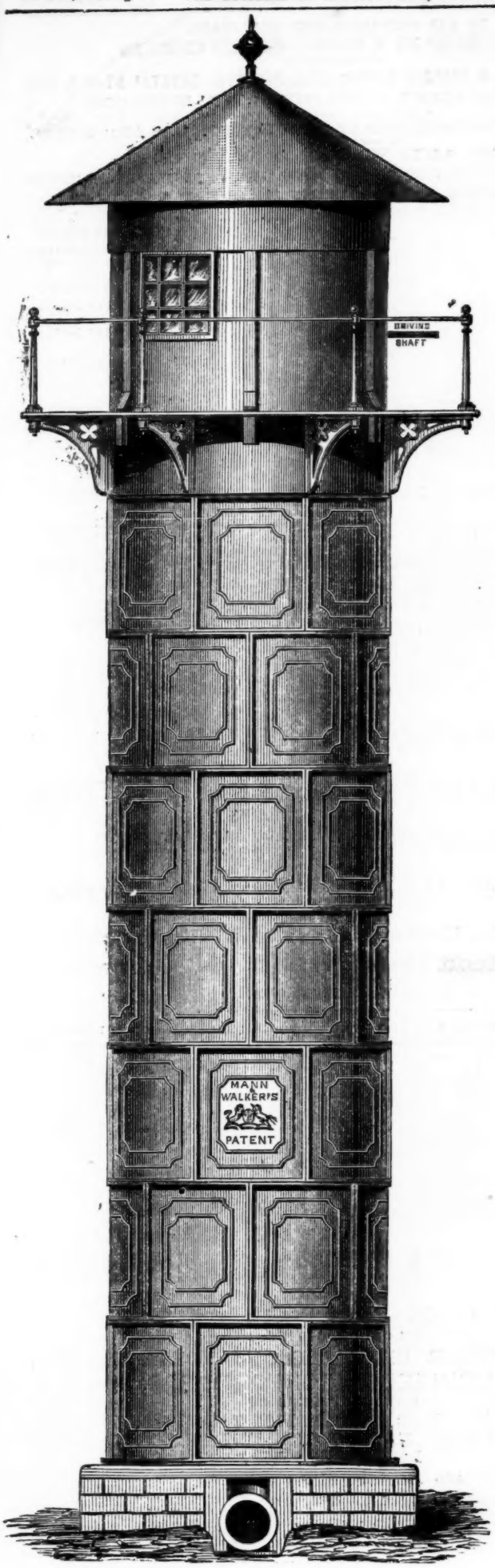


These Engines have been at work a sufficient number of years to prove their durability and efficiency.

One of them has been subjected to a scientific and exhaustive trial to test the consumption of fuel, with the result that an expenditure of less than **2 lbs.** of coal per hour developed one indicated horse power.

Full Details of this Trial, and Prices, sent on application to

B. DONKIN & CO., BLUE ANCHOR ROAD, BERMONDSEY, S.E.



C. & W. WALKER,
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LONDON, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

The improvements made during the past three or four years in all the parts of the internal and external construction and machinery of these Scrubbers have rendered them perfect for their work of purification with all kinds of coal, and their cost is less than any other method of completely purifying gas from ammonia.

They contain their own motive power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, **nearly one hundred being in use,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

Applications relating to dimensions and prices should be addressed to us, C. AND W. WALKER, 8, FINSBURY CIRCUS, LONDON, E.C., or to Mr. WILLIAM MANN, late Superintendent of the Chartered Gas-Works, BLACKFRIARS, LONDON; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

PATENT FUEL AND LIME FOR PURIFYING FROM FOUL LIME.

By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.

Licences to work the invention will be granted to Gas Companies on very reasonable terms.

For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.

The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

COST PRICE SHEETS.

MANUFACTURE AND DISTRIBUTION OF GAS. These sheets are the same as were laid before the Dublin Meeting of the British Association of Gas Managers; but in the REPRINT, NOTES have been added for the guidance of those using them. Copies of the two sheets may now be had, price 5s.

South Shields. W. J. WARNER.

BAILEY'S Patented Inventions are now in extensive use wherever steam is known. Bailey's Patent Steam Gauges, Pyrometers, Water Gauge Cocks, Test Pumps, Fusible Plugs, Steam and Water Valves, Safety Valves, Junction Valves, Pumps, Tell-Tales, Recorders, Lightning Conductors, Electric Telegraphs, Turret Clocks, Steam Joint Cement, Lifting Jacks, Boiler Feeders, Lime Catcher and Separator, Injectors and Ejectors, and every description of first-class Brass Work for Engines and Boilers. Gas-Works Managers who have not our large book should send for it.

16th edition, 1000 engravings, 4to., post free 2s. in stamps, weight 10 oz., cost of production £1000,

BAILEY'S Illustrated Inventions, containing details and prices of goods in our five several departments:—(1) Brass Foundry, Steam Gauges, Indicators, Feeders, and Fittings; (2) Engineers Sundries, Small Tools, and Stores; (3) Machine Pump and Fire Engine: (4) Turret Clock, &c.; (5) Electric Telegraph, A B C Instruments, Bells, and Apparatus.

J. BAILEY and Co., Albion Works, Salford, LANCASHIRE.

BRAY'S PATENT "ENAMEL" REGULATOR GAS-BURNERS.

At the meeting of the North British Association of Gas Managers, held in Dundee in July last, the President, G. R. HISLOP, Esq., spoke very highly of a Gas-Burner, the name of which he did not give. In reply to letter from us, we received the following:—

"Gas-Works, Paisley, Aug. 17, 1875.

"Geo. R. Hislop, Engineer and Manager.

"Dear Sirs,—Your letter and circular referring to your Gas-Burners are to hand, and it will be gratifying to you to know that the Burners I referred to at the meeting of the North British Association of Gas Managers, held in Dundee last month, were your 'Regulator Burners.' I have not only purchased these exclusively for a considerable time past, but have very largely recommended their use to parties in different parts of the country—a fact, the bare mention of which should suffice to convey to you the high opinion I hold of the Burners of your manufacture. But, further, while second to the old iron burners only in price, they are second to none in the economic elicitation of light from a given quantity of gas, burned, of course, under conditions of pressure and volume proper to the size of each burner.

"I am, dear sirs, yours faithfully,

"GEO. R. HISLOP.

"Messrs. Geo. Bray and Co."

☞ *The Price is little more than common Burners.*

To be had of Dealers in Gas-Fittings throughout the World.

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BELGIAN CLAY RETORTS.

J. SUGG and CO., late ALBERT KELLER, GHENT.—The removal of the import duties on Earthenware permitting the entry of Clay Retorts into England, Messrs. Sugg, of Ghent, beg to draw the attention of the Gas Companies of London, and other Cities, to the very superior quality of the RETORTS manufactured by them. They can be made of any size, in one piece, and of any form. The price will be in proportion to the weight, and very moderate in comparison to their value.

Communications addressed to J. SUGG & CO., GHENT, will receive immediate attention.

FIRE-CLAY RETORTS.

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Owner of the Works at which Fire-Clay Retorts were first made), can supply

RETORTS, FIRE-BRICKS, &c.,

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References can be given to managers of above a hundred Gas-Works whom he supplies.

He ships at Charlestown his

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AND EVERY DESCRIPTION OF

GAS AND WATER FITTINGS.

THE PATENT DRY AND WET METER, WITH THE LATEST IMPROVEMENTS.

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Of every description.

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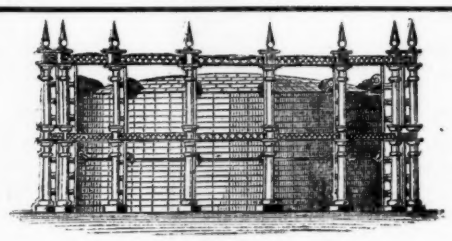

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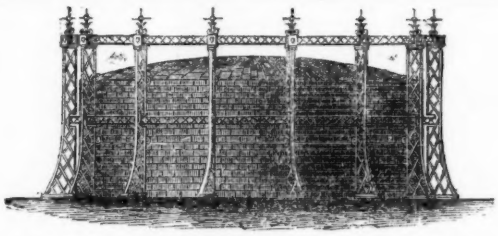

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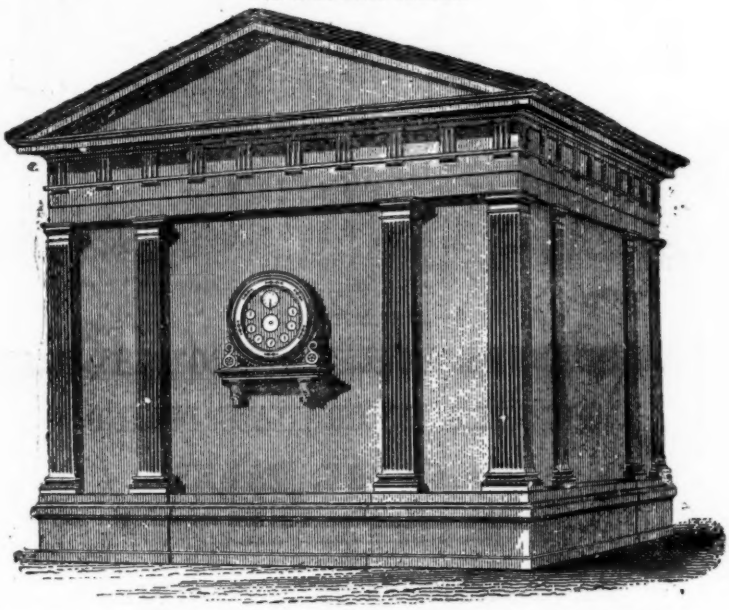

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Orders almost invariably despatched on the day of receipt.

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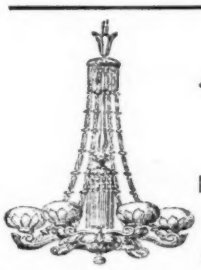

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CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

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STATION GOVERNORS—the Gasholder cannot tilt and cause accident.

BREEZE AND TAR FUEL MACHINE.

A Pamphlet containing Eighteen Illustrations of the foregoing, with letterpress of the construction of Works, post free, 2s. 6d.

N.B.—The second edition of this Work, *now ready*, contains Illustrations of the Machine for converting Breeze and Tar into Fuel for heating the Retorts.

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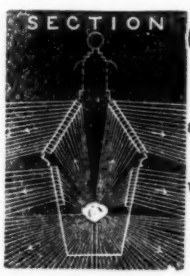

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Is now in use in Moorgate Street, Cheapside, and Trafalgar Square, and has been in successful operation upon Waterloo Bridge since Oct. 7, 1871.

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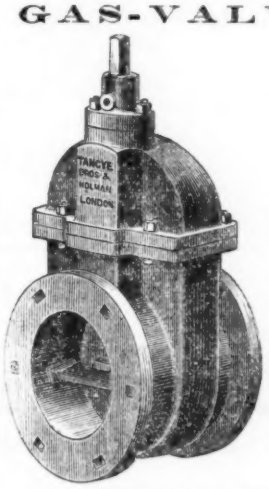

Inch.	s.	d
3	. 25	0
4	. 36	0
5	. 40	0
6	. 54	0
7	. 63	0
8	. 80	0
9	. 85	0
10	. 100	0
12	. 120	0
14	. 140	0

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LAURENCE POUNTNEY LANE

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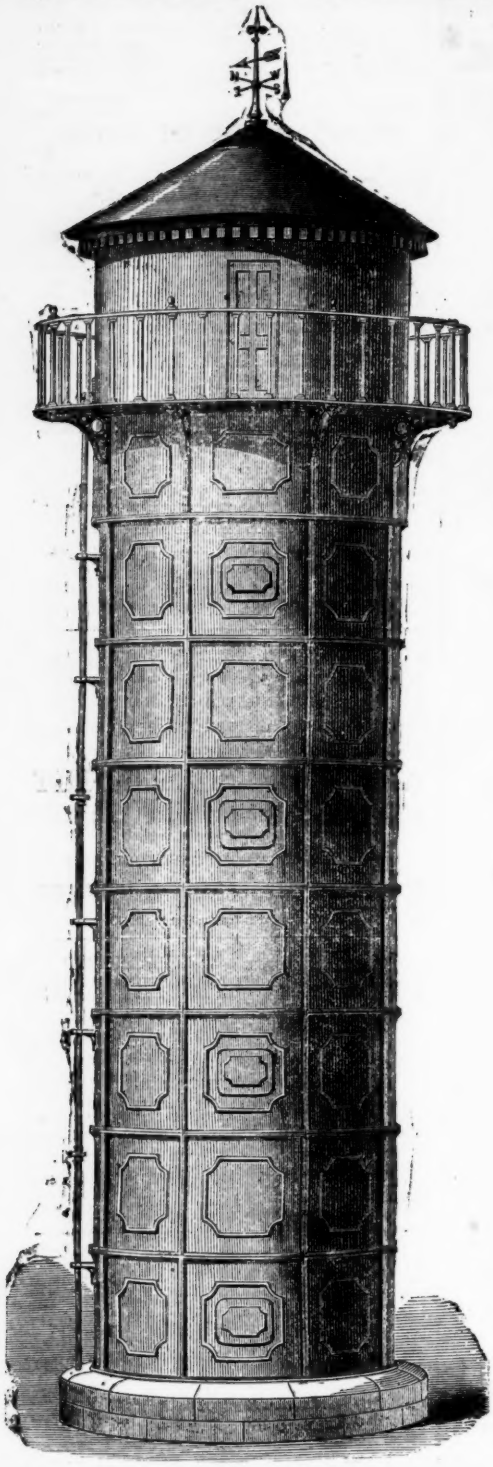

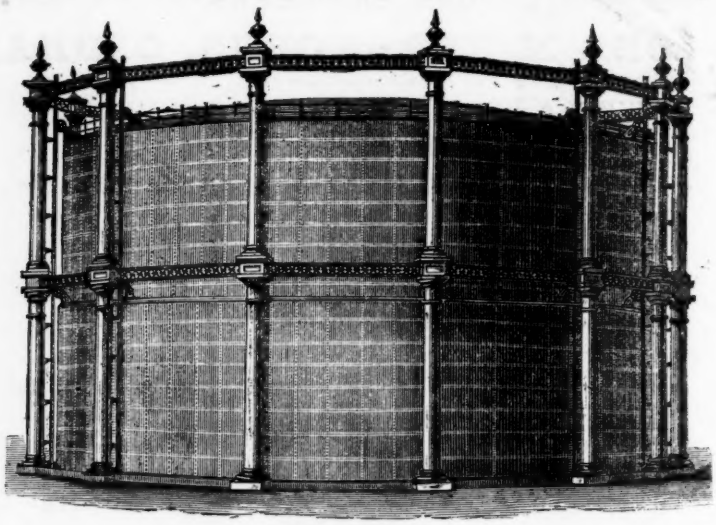

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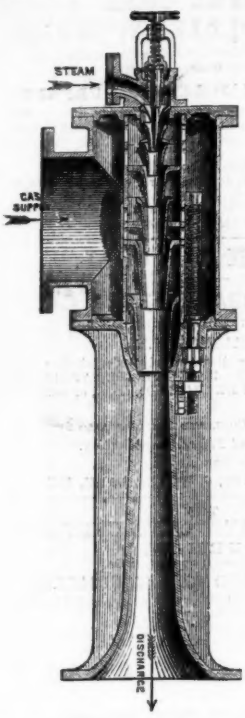

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SOLE LICENSEES FOR

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Small Cost—Compactness—Perfectly Self-Acting—
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No Extra Room Required—No Wear and Tear—No Noise—
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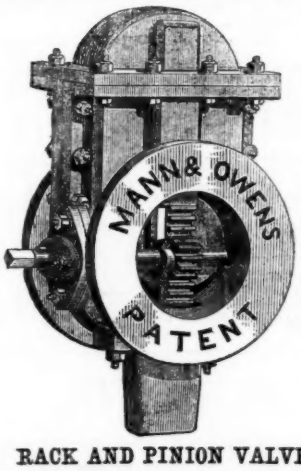
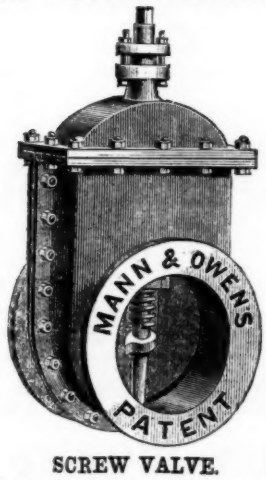
To whom all inquiries for these districts should be addressed.

MANN & OWENS' PATENT GAS-VALVE.



RACK AND PINION VALVE.



SCREW VALVE.

The advantages of this Patent Valve over all others yet introduced are, that it is always as tight as the best wedge or spring valve, without the possibility of setting fast or becoming suddenly leaky. The surfaces not being in contact during the operation of opening or closing, leakage through wear and tear is avoided.

The Gas Engineer will not fail to see the importance of such a valve in connexion with his purifying apparatus, particularly in the case of large sizes.

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Yields 12,500 cubic feet of 34-candle gas per ton, and 9 cwts. of excellent coke, containing only 4 per cent. of ash.

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PRESENT PRICE:
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This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.
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Of the Abram Colliery Company, are worthy the attention of gas producers, showing a good yield of gas and a large residuum of excellent coke. When blended with one-seventh cannel, the gas is of specially high illuminating power.
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STRONGLY RECOMMEND A TRIAL OF THEIR
CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

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Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	**10,775**
Weight of coke in lbs. per ton of coal	**1,465**

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This Company request attention to the very superior quality of their Cannel Coals.

1. The following are the practical results given by Dr. Wallace, of Glasgow, of analyses of their Lochore and Capledrae Cannels:—

	Sample worked at Capledrae.		Sample worked at Lochore
Gas per ton of coal, at 60° Fahr. and 30 inches barometric pressure . .	13,095 cubic feet.	..	11,760 cubic feet.
Illuminating power, in standard sperm candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	32·91	..	34·83
Value of 1 cubic foot of gas in grains of sperm	780	..	836
Equivalent of a ton of coal in pounds of sperm candles	1,459	..	1,404
Durability of 1 cubic foot by 5-inch flame	69 minutes.	..	71 minutes.
Gravity of the gas (air = 1000)	596	..	594

Remarks.—This (the sample from Capledrae) is a Cannel Coal of first-class quality, giving 13,000 feet of 33-candle gas. It contains only a minute proportion of sulphur, and the ash is almost quite white. The coke is of rather inferior quality.

Remarks on Sample from Lochore.—This is a Cannel Coal of first-class quality, giving a large yield of very rich gas and a coke of medium quality.

2. The following are the practical results of analyses by Dr. Wallace of the Company's Waverley Cannels:—

	Capledrae Waverley.		Lochore Waverley.
Gas per ton of coal, at 60° Fahr. and 30 inches barometer	9,120 cubic feet.	..	11,145 cubic feet.
Illuminating power, in standard candles, by union jet consuming 5 cubic feet per hour, at ·5-inch pressure	36·62	..	33·09
Value of 1 cubic foot of gas in grains of sperm	878	..	794
Equivalent of a ton of coal in pounds of sperm candles	1,145	..	1,264
Durability of 1 cubic foot of gas by 5-inch flame	80 minutes.	..	67 minutes.
Gravity of the gas (air = 1000)	677	..	597

Remarks on the Sample of Capledrae Waverley.—This Coal gives fully 9000 feet of gas of 36½ candles, and is admirably adapted for bringing up the quality of gas made from common coal or inferior qualities of cannel. The tests were made at a rather high temperature, this being one of the coals that stand a very high heat without serious diminution of the illuminating power of the gas The coke contains 60 per cent. of ash, and is therefore almost valueless, but the proportion of sulphur is very moderate.

Remarks on the Lochore Waverley.—This is a first-class Cannel Coal, giving 11,000 cubic feet of 33-candle gas. The quantity of sulphur is very minute, and the ash is nearly white. The coke is of inferior quality, but not wholly valueless.

Applications for full Copies of Analyses and Prices may be made to the Company, at

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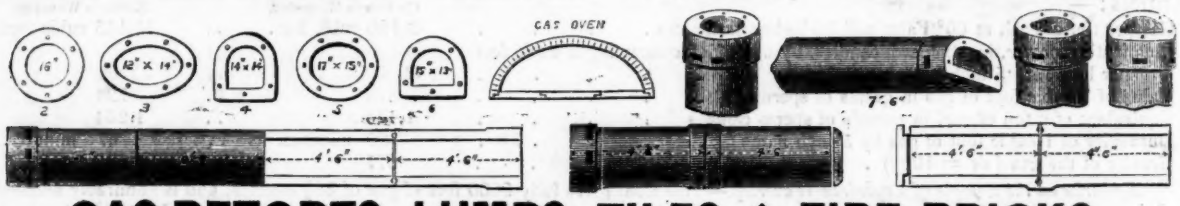

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